The Norwegian Cooperation Model as a Framework for Innovation in an Industrial Company

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Abstract

Based on a case study of a major Norwegian industrial plant, this article explores the role of skilled workers in innovation. We ask what the main organisational conditions are that support the involvement of skilled workers in innovation processes and suggest that the Norwegian model of cooperation at the company level can act as a framework that supports the establishment and strengthening of such organisational characteristics. This form of cooperation between managers and employee representatives, together with broad participation from employees on all levels, can be argued to be important for innovation work, and this case study explores why and how.

The article is based on data material that was also used in Hilsen and colleagues (2022). The case study is based on 6 first-time interviews in spring 2020, and 5 second-time interviews in spring 2021 with managers, union leaders, operators, and apprentices.

Through the interviews, two examples of process innovation were identified and described. Through thematic analysis, it became clear that this form of participation in improvement work and innovation rests on three conditions: A *structure for improvement work* with meeting places and working methods, that the company has developed *a culture for innovation* with trust between the parties and open communication, and that *both formal and informal cooperation on development* has been established.

Key words: Norwegian cooperation model, Innovation, Enterprise development, Broad participation, Skilled workers

Introduction

In a changing working life, innovation is necessary to develop and maintain competitiveness in an increasingly global market. Whereas the organisational conditions for innovation have been the subject of a large body of literature, the role of skilled workers and apprentices in contributing to innovation remains relatively understudied (Hilsen et al 2022, Toner 2010, Backes-Gellner & Lehnert 2021). This case study aims to contribute to the understanding of conditions at the company level that stimulate the use of vocational skills in innovation work and investigates how the Norwegian cooperation model may provide a framework for this.
In Norway, about a quarter of all employed persons have a certificate of apprenticeship, and skilled workers are thus a large and important part of the workforce. Surveys, such as NHO's annual competence barometer, show that there is a great need for more people with a certificate of apprenticeship or vocational school in the companies (see e.g. Rørstad, Børing & Solberg 2021). According to Statistics Norway, Norwegian working life will lack 88 000 skilled workers by 2035 (Cappelen et al. 2020:40). Norwegian working life is also constantly facing new international challenges and demands. This means that Norwegian industry is dependent on a high rate of innovation to maintain its competitiveness.

The industrial plant subject to our case study is one of the largest industrial facilities in Norway. The company's main production is cellulose and a variety of related chemical products. It has a history back to the 1600s and modern industrial activities from the end of the 1800s, and since 1918 the company has been Norwegian-owned. In addition to the development of new products, the company also has a long history of developing new and better forms of production methods to manufacture its products in better, more efficient ways. New products, new work processes and better organisation of work have given the company a central market position. The company considers vocational as well as academic competence to be a prerequisite for such innovation and improvement work, and the company is a significant training institution with around 50 apprentices in training at any given time. This emphasis on competence is also an important prerequisite for full participation in improvement and innovation work.

Studying a company that consistently involves its skilled workers and apprentices in innovation processes, we ask what company-level conditions facilitate this broad involvement in innovation. The Norwegian Cooperation Model is a cornerstone of the organisational culture in our case company, as well as in large parts of Norwegian industry, and we thus investigate what elements of this model that may facilitate and support the involvement of skilled workers in innovation.

In short, the research question addressed here is thus: What are the main organisational conditions that support the involvement of skilled workers in innovation processes, and how can the Norwegian Cooperation Model act as a framework for innovation?

Through the interviews we identified two innovation projects, one implemented and one under implementation. These are described with a focus on how skilled workers, unions and

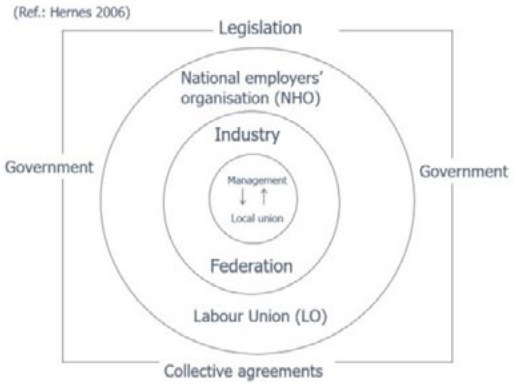
managers were involved. Based on descriptions of these projects, we identified three themes of central importance: *that there is a structure for improvement work* with meeting places and working methods, *that the company has developed a culture for innovation* with trust between the parties and open communication, and that *both formal and informal cooperation on development* has been established. These are analysed and discussed under the heading "What can we learn from this case?". Lastly, we sum up the discussion and answer the research question in the conclusion.

The Norwegian cooperation model

The innovation processes in the company we study take place within an institutional framework where the Working Environment Act, the Basic Agreement and norms for formal and informal participation and cooperation form the basis for a corporate culture where employees actively participate in innovation processes.

The Norwegian cooperation model provides both a historical and practical framework for understanding developments in Norwegian working life. Broad employee participation and tripartite cooperation are both democratic goals in themselves and means of cooperation for good and productive jobs. Nilssen and Ravn (2010) make a useful distinction between 1) the Norwegian model, in the sense of the Norwegian welfare state model, 2) the Norwegian working life model, which emphasises labour market regulations, and 3) the Norwegian cooperation model, which emphasises the cooperation between employers and employees, supported by the Government - in practice, primarily at the enterprise level (Nilssen & Ravn 2010: 7). When we describe the Norwegian model as a framework for skilled workers' contribution to innovation, and the institutional prerequisites for cooperation on innovation, it is about all three levels, but especially about the Norwegian cooperation model.

Cooperation at the enterprise level, what Hernes (2006) refers to as the Norwegian micro-model, indicates that local cooperation is framed by cooperative structures at all levels (Hernes 2006: 34):



The Norwegian cooperation model at workplace level is based on the cooperation between employers and employees regarding good and safe workplaces, but also allows for broad participation in development processes, in which not only the organised parties, but all employees participate.

The Norwegian cooperation model can be seen as a consensus process between parties with recognised common interests in developing productive and good jobs (Munkeby, 2003), but it can also be seen as a negotiated balance of power between parties with conflicting interests and power. "Particularly important in this development was the "great compromise" between the social partners and the settlements between the farmers' and workers' parties in the 1930s. This compromise emerged after a turbulent period of conflict, class struggle and crises in the interwar period, and it laid the foundation for the post-war development of the Nordic working life and welfare models." (Dølvik et al. 2014: 17). With the conclusion of the first Basic Agreement in 1935 between the then Workers' Union and the Norwegian Employers' Association, often referred to as the "constitution of working life", the basis for a regulated working life with recognised rules for cooperation was established. A Basic Agreement is an overarching collective agreement that regulates issues of a fundamental nature between the main organisations on the employer and employee sides. It contains the general provisions on bargaining and cooperation relationships between employers and employees. In addition, basic agreements address the employees' right of co-determination. The Basic Agreement of 1935 was superseded by a new Basic Agreement of 1947. Since then, the Agreement has been repeatedly replaced by new ones. Since the 1970s, it's usually happened every four years. (Alsos & Jakhelln n.d.).

The Basic Agreement simultaneously emphasises company development and safe and good workplaces and can thus be viewed both as a democratic project and as an effective instrument for business development. In the 1960s and -70s, this systematic cooperation was further developed in the Industrial Democracy Programme (IDP), a cooperation between the Norwegian Confederation of Trade Unions (LO) and the Norwegian Employers' Confederation (NAF). The IDP involved four key companies (Christiania Spigerverk, Nobø factories, Norsk Hydro's fertilizer plant and Hunsfos factories), and concerned cooperation on good and productive jobs, based on common interests. The goal was the democratisation of working life through cooperation and development work at the enterprise level (Gustavsen & Hunnius, Gustavsen 1981). Although the experiments themselves were limited and did not spread to the rest of working life, as had been hoped, they had great significance in other ways. One result that emerged from the IDP was the formulation of the psychological job requirements. This is an identification of six conditions that must be present to safeguard the development of good and productive jobs. The conditions include both organisational conditions and individual needs. The psychological job requirements (Emery and Thorsrud, 1969) are:

- "The need for the content of the job to be reasonably demanding (challenging) in terms other than sheer endurance, and yet providing some variety (not necessarily novelty).
- The need for being able to learn on the job, and go on learning (which imply known and appropriate standards, and knowledge of results). Again it is a question of neither too much nor too little.
- The need for some area of decision-making that the individual can call his own.

- The need for some minimal degree of helpfulness and recognition in the workplace.
- The need to be able to relate what he does and what he produces to his social life.
- The need to feel that the job leads to some sort of desirable future."

(Gustavsen & Hunnius 1981:43)

The experiences from the IDP were laid down in the Working Environment Act of 1977. §12 in particular described requirements that directly reflect the psychological job requirements. This has been retained in §4-3 of the current Working Environment Act.

The Norwegian cooperation model thus provides structural guidelines for innovation in the company we are studying; The internal company processes take place within the structural framework of this model, which sets crucial conditions for the development work.

How do we understand innovation?

Innovation is often primarily seen as research and development-driven processes, so-called scientific and technology-based innovation (STI) where internal and external R&D environments are central, although the understanding of innovation has gradually been expanded to include innovation based on learning and experience-based knowledge that the individual employee develops, based on learning-by-doing, by using, and by interacting (DUI) (Jensen, Johnson, Lorenz & Lundvall 2007). The latter mode of innovation seems particularly relevant to understanding what OECD has called "the Norwegian puzzle", referring to the fact that Norway has low investments in R&D in comparison to other advanced economies, yet boasts very high productivity levels and standard of living. Aside from the role of the petroleum sector, a highly educated workforce, and the role of learning work organisations, dominant in Norwegian manufacturing, has been suggested as key explanatory factors (Asheim 2012). We also note that innovation is not just radical or disruptive new creation based on investments in R&D, but often incremental and based on learning through practice and experience, resulting in smaller, but continuous changes. This is typically what coordinated market economies such as the Nordics are efficient at, through knowledge diffusion and learning organisations, with large absorptive capacity (Hall and Soskice, 2001). It is the prominent form of innovation in firms with a synthetic knowledge base, typical for Nordic manufacturing companies, where the innovation takes place mainly through the application of existing or new combinations of knowledge, often with reliance on tacit knowledge due to more concrete know-how, craft and practical skill (Asheim & Coenen 2005).

In innovation research, surprisingly scant attention has been paid to the involvement of skilled workers in innovation activities. However, a high proportion of skilled workers in Norwegian manufacturing companies state that they have been involved in development work, particularly in processes that involve new or improved organisation of work (Solem et al. 2016). This can happen both through the skilled workers themselves taking the initiative for improvements based on their competence and experience, and by being actively involved in

improvement processes initiated by management, such as the introduction of new technology. While the latter can be described as planned innovation that originates from "above", i.e., from managements, R&D etc., the former will be more unplanned and contingent on limited power distance (Hofstede 2001) as well as expectations of and rights to employee participation. The participation of skilled workers in such processes hinges on their competence as well as an understanding that workers should be able not only to conduct work processes, but to participate in improving them.

Even though skilled workers participate in improvements of products and processes in Norwegian companies, our knowledge of the importance of skilled workers for innovation work in Norwegian business and industry is limited (Steen et al. 2018). Moreover, vocational education and training is rarely a topic for innovation research or innovation policy. We therefore wanted to take a closer look at how skilled workers participated in development work and what this meant for the company's ability to innovate.

Method

This article is based on data material that was also used in Hilsen and colleagues (2022), where the company was included as one of 6 cases. In this article we have chosen to take a closer look at one case that particularly shows the importance of local cooperation in development and innovation work. The case was chosen as it is known to be working within the framework of the Norwegian cooperation model, and in this way can contribute to our knowledge of how this model supports or enables broad participation in innovation.

This article is based on 6 first-time interviews in spring 2020, and 5 second-time interviews in spring 2021. We interviewed managers at several levels, union leaders, operators and apprentices, a total of 11 interviews. The interviews lasted approximately 45 – 60 minutes each. The first round was conducted physically at the factory, while the second round was conducted digitally. The interviews were recorded on tape and notes taken along the way. The taped interviews were subsequently transcribed, and it is this material that forms the basis for the analyses.

The focus of the interviews was thus how participation in development work had taken place, with questions about which projects or processes the company had conducted to improve/develop a product, service, or work processes during the last few years. Where did the idea originate and how was it implemented? The skilled workers, the operators who carried out the work in the factory, were also asked whether their education (certificate of apprenticeship) had provided any advantages or expertise that has been useful to the company in the process. Regardless of the level and function of the company, we also asked if there were times when they saw opportunities for improvement in the company, either in the work process, the way they work (organisation, working methods, equipment, collaboration, etc.), or in the product or services the company provides. We were also concerned with whether management expected employees to look for and suggest improvements, and whether there were any routines in the company for handling

improvement proposals. These questions were posed to both managers and employees at all levels. In addition, we interviewed the main employees' representatives (previous and current club leader and youth union representative) about the trade union's role in development work.

To analyse the data, we used thematic analysis, defined as "a method for identifying, analysing and reporting patterns (themes) within data" (Braun & Clarke 2006: 6). The steps of thematic analysis are: 1. Familiarising yourself with the data, 2. Generating initial codes, 3. Searching for themes, 4. Reviewing themes, 5. Defining and naming themes, and 6. Producing the report. (Braun & Clarke 2006: 16-23).

In the first interview with the manager in charge of continuous improvement and training, we asked about innovation projects and identified one that was finished (Project 4 Consoles) and one that was running (Project Maintenance Plan) and still being implemented. In the following interviews we asked about the projects, and who had been involved and how. In addition, we asked about cooperation and innovation, with a particular emphasis on forms of cooperation and the involvement of skilled workers.

After transcribing the interviews, we developed descriptions of the two projects, with a focus on cooperation and the role of managers, union representatives and skilled workers. After coding the different types of cooperation and examples of how innovation work was organized, we searched for themes, and identified three themes: A structure for innovation; A culture for innovation; and Formal/informal cooperation. These three themes will be presented and discussed below under the heading "What can we learn from this case".

The practical and societal relevance of the research is to contribute to knowledge of how the Norwegian cooperation model supports innovation and development work at the enterprise level. The scientific contribution is linked to three points. First, the case was selected, in cooperation with the social partners, as an example of a tradition that goes back to the Industrial Cooperation Programme in the 60s and 70s and thus allows us to see how this type of cooperation contributes to modern innovation and enterprise development. Second, the questions asked aimed at discovering the importance of the type of cooperation at the workplace, and particularly the role of skilled workers. Third, we want to demonstrate the importance of systematically interviewing both managers and union representatives, as well as ordinary skilled workers, to discover how the Norwegian cooperation model is important to innovation. By ensuring that both management and the union is involved, we can explore the importance of the cooperation model and what it means at the enterprise level.

Results and discussion

Both apprentices and skilled workers participated in development work and were encouraged to contribute with their experiences and suggestions for improvement in improvement project groups. Participation from employees on all levels of the company is described as central to the development of process improvements. Cooperation and is

facilitated both through organizational structure and company culture. As one apprentice described it, "I feel like it's a mind-set that we have at [name of company], finding solutions to things." Both managers and union representatives talked about two major projects that illustrate how they work with process innovation through broad participation. One example is the introduction of a common operations centre for the entire factory, a project they call Project 4 consoles. The second project is a restructuring of the maintenance plan on a new coordinated, technological basis. The description of these two projects is taken from Hilsen et al. 2022: 69-74.

Project 4 consoles

The project involves the co-location of 15 former control rooms into a centralised operations centre with a common control room, with four consoles. From here, all control data is communicated to all the plants on site (approximately 20 plants) and monitored from four stations. The entire plant is currently operated from this control room, which is served by skilled workers. The management and the trade union (LO, which mainly organises most of the people who work in production) have been central to the process from the start. As the main union leader described the process around 4 consoles:

In 2007, the first discussions [between management and the union] started and then it was a little loose around the edges when it started. But then we had a lot of meetings to discuss the project, and we also used the supervisory board of the union, because that includes all parts of the production apparatus. And then we had a very open and good dialogue. We ended up deciding that we wanted to go all in on that change and that we combined control rooms in an operations centre.

The work was organised with a working group in which the technical operators [skilled workers] participated. The argument we heard from both management and employee representatives was that the skilled workers were closest to the production and had experience of what worked and what didn't. As one manager said about involving skilled workers in all forms of improvement work:

You run the plant every day, and you always experience things. They [operators] always have ideas about: can't we cut it out or redo it or take it away or reprogram it; Something, I think, comes up every day.

The working group met regularly throughout the process from the start of work on the project until the new control room with the four consoles was in regular operation. In relation to change processes over the years, a meeting structure and a way of working emerged that is suitable for promoting employee-driven innovation. In connection with moving into new premises, systematic meetings were started between those involved, including managers, employee representatives and affected employees. Although these regular meetings were

intended as a way to carry out the actual relocation process in the best possible way, they were found to be useful as a more permanent structure for dialogue on improvement work even after the relocation project had been completed. Thus, it was decided to hold such informal collaborative meetings beyond the specific project.

It was basically meant for the project, but we ended up with a new work process that we've never had before.

The meetings also had a targeted professional content, and the relevant professionals, both engineers and skilled workers, participated. These meetings would have different participants depending on the departments and production areas involved, as in the case of Project 4 consoles.

In addition, they had previously introduced a weekly more informal meeting between management and the union where they addressed large and small issues based on needs. These meetings came about in connection with a major restructuring process, where management felt the need for a more informal channel for dialogue with the union beyond the regulated orientation/discussion/negotiation meetings. Because it was an informal type of meeting, they could range from professional matters such as upcoming changes in the factory, the introduction of new technology or announcements, to employees asking for information about internal matters, or just small talk. As one said, "And then we talk a little bit of football once in a while, get a little loose." The purpose of these meetings was to provide a meeting place for more informal contact, where they could identify issues before they become large and must be handled in other more formalized forums.

Project 4 consoles was completed and in regular operation when we first visited the company in 2020.

Project Maintenance Plan

The maintenance work is carried out by skilled workers in the maintenance department. They perform requested or scheduled maintenance and report after the work is done, previously on paper-based forms. This meant that maintenance workers could be ordered to carry out a repair somewhere in the factory, and not until they came into the office and looked at the order forms, did they see that another problem had arisen in the same area, which could have been rectified immediately if they had known about it. This was both cumbersome and ineffective. Management had visited another company and seen their system, which was digital and seemed to better meet the needs of those who planned, ordered, and performed maintenance work. They brought it back and discussed it with the union representatives and agreed to develop a similar system, adapted to their own business. Initially, it was defined as Project Maintenance Plan, and a steering committee was set up with factory management and union representative, and a working group was established from the part of production

where the project began, in which local managers, union representatives and skilled workers participated (Hilsen et al. 2022: 71).

The maintenance plan is about the introduction of continuous maintenance schedule that is updated digitally, so that every time changes are made to the underlying system, this is shown on a big screen out in each factory area. The intention is for all affected parties to be always familiar with the maintenance plan. Information about maintenance tasks and their status is entered continuously via an app on the phone so that everybody can see whether the job is ongoing or completed. The intention is that operations always should know what the maintenance plan is, i.e., what maintenance should be done where, at any time.

The starting point for the project was a need to be able to plan the maintenance work daily, not just weekly planning as before. As mentioned, a lack of overview of upcoming maintenance tasks created frustration both among those who had to plan and perform maintenance and those who needed the maintenance done. This was a shared experience among management and employees, and the steering committee and working group ensured broad support and participation from everyone involved. In addition, they wanted a digital solution so that maintenance workers could continuously monitor, and report performed maintenance. With more detailed and ongoing plans, it was easier to follow up, plan and prepare the work from day to day.

The new maintenance plan ensures equal, up-to-date information to all departments through the digital system. Thus, maintenance needs that the operators (skilled workers), but also department managers, discover out in the factory can be reported on an app on the phone, as text or with a picture, and enter the system as the required maintenance task. The company wanted to involve all employees in reporting maintenance needs, while the system ensures that maintenance plans are shared and updated. Such a system makes the individual skilled worker responsible for notifying when they discover a maintenance need, but it also gives them a direct line to the maintenance department through the app, so that they do not have to go through their line managers to report the problem. This underlines the company's message that everyone is needed and wanted in improvement work. To repeat the quote from an apprentice we interviewed: "I feel like it's a mind-set that we have at [the company], finding solutions to things."

The company started the project Maintenance Plan locally in one part of the factory, before the concept was implemented in the other areas. In the interviews, differences emerged in the reactions where the employees had been involved in developing the solution and where they had it introduced afterwards. Ownership and anchoring underpinned positive attitudes to the maintenance plan in the areas that had helped develop the plan and an understanding of why the solution looked the way it did. From other areas, we were told about some resistance and lack of understanding of why they needed the chosen solution. The use of the maintenance plan on mobile phones also opened discussions about what kind of mobile phone agreement one had at the company and whether everyone needed a smartphone

with this app. Although we were told that there was great agreement on the need for a better way of planning the maintenance work, the chosen solution was received with some scepticism by those who had not participated directly in the actual development of it.

The advantage of developing it in one area first was both to ensure broad participation in the development and testing there, which would have been difficult if one tried to involve all employees in all the factory areas (local plants) at the same time. Because the area that had helped develop the solution was satisfied with what they had come up with, they also functioned as "internal ambassadors" who could convey why they were satisfied with the chosen solution. Although the expressed scepticism we were told about did not sound like a major problem, it shows the difference between solutions one has helped develop and ready-made solutions one is presented with from the outside.

What can we learn from this case?

Both projects stem from perceived frustrations over aspects of the production process that did not work optimally. Through the systematic involvement of employees on all levels of the company, better solutions were developed, which were then implemented in the organisation. Crucially, this did not only involve all the different departments, management, R&D personnel and engineers, but also consistently maintenance and production operators (i.e., skilled workers) and union representatives.

Through the interviews, it became clear that the company's successful inclusion of skilled workers in improvement work and innovation rests on three prerequisites: *that there is a structure for improvement work* with meeting places and working methods, *that the company has developed a culture for innovation* with trust between the parties and open communication, and that *both formal and informal cooperation on development* has been established.

A structure for improvement work

Based on our analyses, we identified the importance of a *structure for systematic dialogue and cooperation*, both in formal working groups in the major development projects, and in more informal forms in the daily improvement work. Both employees at different levels (apprentices, skilled workers and engineers) and management emphasised the value of having an open dialogue and an ongoing focus on improvements, and channels for this cooperation.

Both the employees and management pointed out that working groups appointed for individual projects, formal and informal meetings and daily meeting places were all important. All employees were used to get together to talk about development and possible improvements of work processes, and they had meeting places to do so. In organisational development literature, there are several concepts to describe such forums for improvement

work. Pålshaugen describes this as a *development organisation*, a parallel structure to the production system and the negotiation system (Pålshaugen 1999). By defining such a structure, he argues that organisational development needs the same systematic approach and structure as are already in place for production and negotiation. Zand (1974 in Lebesby, Finnestrand & Vie 2023:81) introduced the concept of a parallel organisation (PO) as a supplement to the operating organisation for problem-solving that need cooperation in a more flexible way. Lebesby, Finnestrand and Vie (2023) describes the function of the Parallel Organisation as a "dancefloor" where the social partners can dance, that is jointly explore possibilities in cooperation, rather than boxing, as negotiation can be likened to. These concepts of a structure for improvement work underlines the cooperative, flexible and non-hierarchical relationship between participants, be they managers, unions or ordinary workers, - or in our case, skilled workers.

As previously described, the company introduced a weekly, informal meeting between management and the union. This was started during a period of major reorganisation and change, where management realised that they needed to have an ongoing dialogue with the union throughout the process, in addition to the statutory orientations, discussions and negotiation meetings set down in the Basic Agreement. Because these meetings did not have an agenda, one had the opportunity to bring up what was relevant at any given time, or just small talk loosely if there was not much going on. This meeting structure worked satisfactorily for both the union and management, so these weekly meetings were retained. The importance of having a fixed structure with flexible content was highlighted as important. Both parties could keep each other informed about matters that might be under way or matters that did not fit into the formalised channels for cooperation pursuant to the Basic Agreement. This meeting structure was also important to catch development and improvement ideas that had not yet been adopted or had received a working group or similar.

A culture for innovation

It is not enough to have meeting places if the company does not have a culture of innovation with open communication and trust between management and employees that proposals will be positively received. This was the second theme identified in the interviews. As union representatives said:

I think we're relatively good and in line with the LO [Labour Union] tradition, about productivity and thinking about that, that we all want to contribute now. It's not just getting paid and be happy with it but having discussions around profitability and necessity of improvements.

Both innovation projects, 4 Consoles and Maintenance Plan, demonstrate broad participation, where all levels, from apprentices, skilled workers and engineers through senior management, participated and contributed from their different points of view and experiences. Because the projects concerned the organisation of daily work in the factories,

it was seen as self-evident that the operators who performed the tasks should participate in the development work. This also demonstrates the importance of involving employees from the time they are apprentices, so that the foundation for participation is laid and an understanding developed that participation is expected from all employees regardless of position. Those working at the shop floor level are also the closest to being annoyed by things that don't work well or seeing opportunities to do things differently and better. Thus, it must also have been made clear to everyone that input for improvement is welcomed and will be assessed and possibly realised.

This culture of employee participation is part of the Norwegian cooperation model, as discussed in the introduction, where we recognise both the learning dimension from the psychological job demands (Emery & Thorsrud 1969; Gustavsen 1981) and as expressed in the current Working Environment Act:

Section 4-2. Requirements regarding arrangement, participation and development
(2) The design of each employee's working situation shall pay regard to the following:

a. *arrangements shall be made to enable the employee's professional and personal development through his or her work,*
b. *the work shall be organised and arranged concerning the individual employee's capacity for work, proficiency, age and other conditions,*
c. *emphasis shall be placed on giving employees the opportunity for self- determination, influence and professional responsibility,*
d. *employees shall as far as possible be given the opportunity for variation and for awareness of the relationships between individual assignments,*
e. *adequate information and training shall be provided so that employees can perform the work when changes occur that affect their working situation.*

Our case exemplifies a company where professional responsibility is strong, employees are encouraged to participate actively in learning and development work, are provided opportunity to influence their own work situation, and are involved in development work and changes that affect their own work situation. In practice, this is enabled through a meeting structure that invites this and a culture where participation in development work is both desired and expected.

Participation in innovation is also about building trust between management and employees and developing an expectation that proposals are received in a constructive manner. Although not all proposals can be realised, it is important that employees know that proposals are taken seriously and considered. This trust is built up over time and is strengthened every time someone brings something up and experience being listened to.
For skilled workers to contribute to innovation, they must also have the necessary expertise. Competence is developed first through vocational training, but as importantly, through subsequent work as a skilled worker and on-the-job training. Again, we recognize the knowledge from the Industrial Democracy Programme through the psychological

requirement defined as: "Need to be able to learn at work" (Emery & Thorsrud 1969; Gustavsen 1981). The workplace becomes an important place of learning, and 'if skilled workers have work tasks that require learning and provides opportunities for learning, they are also better able to contribute to innovation than if, for example, they have narrow tasks and little independent space to decide how to do the work' (Hilsen et al. 2022: 12). The case company attaches great importance to active participation in development tasks and a wide scope for pointing out areas for improvement, both for the individual employee and for their representatives through the social dialogue.

Formal and informal cooperation

The third theme to emerge was forms of cooperation. Cooperation, both formally through the social dialogue and informally through broad participation, is central to the Norwegian cooperation model. Our case study illustrates well the importance of both these types of cooperation for innovation work. Both projects used the structures of collaboration and innovation through working groups with a broad composition, anchoring the process with the trade union and management. Since process innovation is intended to improve work processes for the benefit of both the employees' work and the company's results, it fits into the Norwegian cooperation model, where both parties have more to gain from working together than from assuming the role of adversaries with conflicting interests.

Cooperation on development and innovation also requires the employees to have a certain degree of autonomy in their work, so that skilled workers have room to assess whether the work operations they carry out could have been done in other ways. The need for the work to have substance in the form of requirements for different activities and the need to be able to make decisions (psychological job requirements), deals with aspects of autonomy. Both the fact that the work is varied and allows the workers an understanding of the work tasks in a broader way, and that the employees have the job latitude to influence their own work situation, help to provide control. Research on control at work states that control deals with several aspects of work: control over work pace, autonomy, predictability and decision-making (Aronsson 1989). As we can see, these are aspects of a concept that make the workplace a place for both learning and influencing. Amundsen and colleagues (2011) point out that "autonomy is regarded as important when it comes to enabling innovation, but it is emphasized that it may be of particular importance for the idea generation phases, i.e. the early phases of the innovation process" (Amundsen et al. 2011: 216). American innovation literature also emphasizes autonomy and employee participation in innovation (Miles et al. 2005), and points to Scandinavian working life as less hierarchical and more egalitarian, and thus easier to make use of the knowledge of all employees in innovation work (pp. 47-48, 116).

Our case demonstrates the importance of skilled workers' contribution to innovation, and the company seems to be clear that this climate for commitment and broad participation is

valuable for innovation. Leadership is an important factor in enabling this form of innovation. Management must encourage participation in improvement work and the use of the job latitude (autonomy) employees have in their work to look for improvement. As Amundsen and colleagues summarise: "The most important management strategies here were to give employees a high degree of freedom to make their own decisions and at the same time be readily available for discussion and consultation. This must be linked to management expressing clear expectations of employees that they are constantly searching for new solutions in addition to performing their defined tasks" (Gjelsvik 2007 in Amundsen et al. 2011: 215). As our case demonstrates, both informal and formal participation is important, i.e., both the daily interaction between employees and managers and the formalised cooperation between management and the trade union. "While emphasising the importance of direct participation, it is also emphasised that trade union representatives have an important role in building relationships and good working relationships between managers and employees" (Amundsen et al. 2011: 215). As previously described, the trade union representatives in the company we examined also highlights a long tradition of cooperation on development and refers to the Norwegian cooperation model.

Conclusion

There is little research on the role of skilled workers in innovation and enterprise development (Steen et al. 2018), and our study aims at closing this gap.
The case that forms the basis for this article is an example of innovation through broad participation and cooperation in a major Norwegian industrial plant. It demonstrates the importance of involving skilled workers and apprentices in development work, where they can contribute their experience and knowledge. It also shows how the Norwegian cooperation model provides a framework for understanding this type of development work and the assumptions on which it is based.

The Norwegian cooperation model is based on established cooperation at the company level and trade unions that handle the role of both opponent and partner vis-à-vis management. This form of cooperation, together with broad participation from all levels of employees, has proven to be important for innovation work, especially when it comes to process improvements. Our case shows a company that actively uses the expertise and commitment of skilled workers in development and innovation work, and where the employees' knowledge, experience and ideas is used to develop new and improved work processes in the company.

Based on the descriptions of innovation projects in our case company, we can identify three conditions that must be in place to succeed:

The first condition is about systematising improvement work through structures and meeting places, where one meets across levels, departmental and professional boundaries around improvement tasks. This is reflected at all levels, from regular meetings between management and employee representatives (beyond the formal meetings for discussions and negotiations) to working groups involving those relevant to the topic being discussed and the type of

development area concerned. Development work also requires organisation, and in the same way that operational tasks are organised and systems and meeting places for negotiations are established, there must be organised spaces for development work.

The second condition is that there is a culture for innovation, that there is a clearly communicated expectation from management that it is desirable for all employees, from the apprentice to the engineer, to speak up if they see tasks and processes that could be improved, and for them to be confident that input will be welcomed by management. Not all proposals and suggestions can be realised, but one should at least be sure that the proposal will be well received. This was highlighted by all our informants, both from management, trade unions, skilled workers and apprentices.

The third key condition is about participation in formal and informal cooperation and the competence to do so. For apprentices and skilled workers in production to participate in improvement work and identify areas for improvement, they must have real access to formal or informal forums for cooperation, but also the necessary expertise. Competence to perform one's work, but also competence to see one's work in the context of the work of others. This is precisely about the kind of broader understanding of the work discussed in the first two psychological job requirements, i.e., Need for the work to have a content in the form of requirements for different activities and need to be able to learn at work (Emery and Thorsrud, 1969). The insight behind the psychological job demands describes the path from manager-controlled work with narrow task profiles and little competence beyond just one's own work tasks. In order to participate in development work, the workers must both meet a wide range of tasks and be encouraged to familiarise themselves with new tasks. In our case, the company is concerned that the apprentices meet a wide range of tasks, and through the training of the apprentices they also secure their recruitment base of competent skilled workers. The company mainly recruits apprentices they have trained themselves, and thus they have had the opportunity to both ensure good training and communicate expectations for commitment and participation in improvement work from all employees. Competence is necessary to fully participate in both formal and informal cooperation and is the third cornerstone of innovation in the company.

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