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Abstract

Purpose

The aim of this invited article is to explore how more complex epistemic environments generate opportunities and challenges for organizational learning in professional realms. Based on these explorations, a second aim is to discuss whether there are specific conditions in Nordic working life that facilitates or restricts such learning opportunities.

Design/methodology/approach

The article examines conditions for organizational learning in terms of changing knowledge practices and relations. Examples from studies of knowledge work in the Norwegian education and health sectors are provided to illustrate how professionals become involved in epistemic practices as part of their work, and how these practices are changing in relation to evolving knowledge cultures.

Findings

The article conceptualises and discusses how knowledge practices are changing in relation to specific and increasingly complex epistemic environments. It is argued that features such as low power distance, high levels of higher education participation, well-developed digital infrastructures and a general trust in professionals are conducive to learning. At the same time, taking advantage of learning opportunities are increasingly depending on individuals' agency and capacities to cope with new demands.

Originality

To better account for the complexity of epistemic environments, organisational learning can be seen as a matter of connecting epistemic practices in the local work organisation to wider knowledge circuits.

Key words: Organisational learning; Professions; Epistemic environments; Digitalization; Teachers; Health professionals; Norway; Nordic societies

Introduction

Organisational learning is tightly related to knowledge and knowing. The practices and arrangements that allow practitioners to explore and share knowledge are crucial to changes in ways of knowing, and therefore to learning, in organisations. In our times, these processes are embedded in

increasingly complex epistemic environments. More advanced digital tools and infrastructures for information sharing alter the cognitive and social dimensions of work and bring about new tasks and responsibilities. Expectations of user involvement and stakeholder collaboration in professional work serve to extend the spatial organisation of work practices, softening some organisational boundaries while creating others. A more diverse set of actors involved in organisational life brings different knowledge forms and concerns to the fore, which amplify the needs for articulating, negotiating and legitimising knowledge claims. Such actions are important for organisational learning as they mobilise knowledge sharing and potentially change the way work is performed.

In this paper, I discuss how more complex epistemic environments create opportunities and challenges for organisational learning in professional realms. I take a practice-based and socio-material stance, implying that knowing and doing are seen as entangled and emerging in the practices of an organisation (Gherardi, 2011). These practices are realised as an effect of specific interactions between humans and non-human materiality. Hence, this perspective also highlights the need to take a 'more than human' approach to practice and to account for the various ways social, epistemic and other material elements come together in the ongoing realisation of organisational life. In this paper, special attention is given to the practices through which knowledge and ways of knowing are generated, shared, explored and acknowledged in professional settings, as well as to how changes in such knowledge practices are related to the wider epistemic environment. This implies that I will use the term 'organisational learning' rather than 'the learning organisation' and approach organisational learning as a matter of achieving change or stability in the 'collective, knowledgeable ways of doing' (Gherardi, 2011, p. 57). Such 'doings' are understood as situated yet not locally bounded. To understand changes in professional knowledge practices, we need to acknowledge these practices as interrelated and formed through connections and linkages to external actors and processes, within and beyond the professional realm (Nerland, 2018; Noordegraaf, 2020).

I start by elaborating on trends that generate complexity in the epistemic environments of professional life, raising some questions about how and whether these trends provide specific challenges and opportunities in Nordic contexts. Next, I present and discuss some examples from research we have conducted in our research group, targeting knowledge practices and learning in the education and health sectors. I end by discussing how the perspectives and examples are relevant for our understanding of organisational learning, and more specifically for organisational learning in the Nordic context.

Epistemic environments and their complexity

Professional work is typically organised as specialist fields of occupational activity in which demands for expertise are shared with and recognised by fellow experts (Winch, 2017). This distinctiveness further relies on a division of labour, which allows for differentiation between forms and levels of accomplishment in expert work. Hence, the collective and knowledgeable ways of doing certain types of work are at the core of professional communities (Gherardi, 2019). What kind of knowledgeability is required to be recognised as a professional is not stable; instead, it changes with the evolving expert culture. Such cultures span organisational boundaries because they relate to wider professional knowledge domains, such as medicine, engineering or law. At the same time, they manifest in specific work environments and organisations. From this perspective, knowledgeability is a collective and dynamic phenomenon that is performed in practice, and at the same time formed by and recognised through its relations to the wider expert culture and its epistemic characteristics[i].

One source of change that generates increased epistemic complexity in expert cultures relates to the ongoing digitalisation processes that permeate social and professional life. A range of scholars have focused on the implications of technology use for professional work and learning, showing how the performance of expertise is formed in relation to the ongoing use of technologies (e.g. Anthony, 2021; Mäkitalo & Reit, 2014; Pachidi et al., 2020). When technologies change, so do the ways of knowing and doing work. As technologies become more complex and interrelated in larger infrastructures, the demands for professionals and their work communities are growing. Scholars have pointed to how technologies must be adapted and sometimes reinvented when they are taken into use in local organisations, which may require future-oriented engagement (Nevo et al., 2016). Furthermore, the work of configuring technologies such as information systems, and work practices for each other requires extended competencies. These competencies may for instance include a thorough understanding of both the work practices and the information ecology in which they are embedded (Herzum & Simonsen, 2019). This implies extended epistemic and social responsibilities.

Another generator of increased epistemic complexity is the growing number and diversity of knowledge-generating actors that aim at influencing professional practice. In addition to research and practitioner communities affiliated with the profession, such actors may, for instance, include government agencies, clearing houses, user communities and technology vendors. As more actors engage in efforts to produce, synthesise and spread knowledge and models for good practice, professional work becomes more 'multi-charged' (Knorr Cetina & Reichmann, 2015). This means that work settings become imbued with multiple objectives, purposes and concerns, which generate tensions that need to be resolved in the practices. In multi-charged settings, professionals' responsibilities move beyond the task of attending to problems of practice and making use of given

knowledge sources in productive ways. Indeed, professionals will often bear extended epistemic responsibilities in the sense that they need to engage in selecting, assessing, integrating and adapting knowledge and advice of various kinds in the ongoing enactment of work practices. This even includes coordination and stakeholder management because deciding on which actors to relate to and what advice to trust becomes a professional task in itself. Demands to knowledgeability thus become multi-layered.

In the wake of increased epistemic complexity, new opportunities and challenges to learning arise. For those capable of taking advantage of the changes, new career paths and opportunities for expansive participation may manifest. However, as discussed in several studies, such opportunities are not equally distributed. Anthony (2018) suggests that status differences in work communities influence the ways different groups of knowledge workers respond to the introduction of new epistemic technologies, distinguishing between engagement in 'questioning practices' or 'accepting practices' as two general modes. Similarly, Nevo et al. (2016) point to the need for agency among professionals to engage with knowledge and technologies in future-oriented and generative ways. Previous experiences and a mindset geared towards learning among professionals may influence how opportunities are identified and realised (Simons & Ruijters, 2014).

A critical question for the theme of this Special Issue is whether we can anticipate that characteristics of Nordic work organisations and professional communities matter for such learning opportunities. Following from Anthony's (2018) theorising, hierarchies and power relations between leaders and groups of workers matter for the distribution of expansive participation (or engagement in questioning practices). Leaders' inclusive behaviours and efforts to mitigate status differences are seen as important for involving more worker groups in collective, knowledge-generating activities by way of questioning practices. Moreover, if leaders and advanced workers do not experience the engagement of newcomers or lower skilled persons as a threat, the latter groups may see questioning practices as an opportunity to advance their position and work. Hence, the relatively flat hierarchies and low power distance that are often highlighted as features of Nordic work organisations may also be beneficial where distribution of learning opportunities is concerned (Warner-Søderholm, 2012; Introduction to this Special Issue).

Furthermore, workers' level of previous knowledge matters. Taking advantage of opportunities to learn in a complex environment is a challenging task and requires enrolment in the professional knowledge culture (Jensen et al., 2015). Nordic societies are characterised by high levels of higher education participation, and during the last decades, we have witnessed further expansion in the higher education systems (Thomsen et al., 2017). In Norway, most professional programmes are now

offered by universities or university colleges, with opportunities for master's degree specialisation. Nordic countries also tend to prioritise formal education over alterative qualification routes within a largely public educational system (Underthun & Drange, 2018), which may lead to stronger epistemic coherence in ways of cultivating and recognizing professional expertise. In line with the so-called accumulation hypothesis in research on lifelong learning, we may anticipate that longer education with emphasis on problem solving, critical reflexivity and academic skills generate capacities for continued learning and engagement with new knowledge in working life.

Third, the general level of trust in both the public and private sectors may play a role in the way professionals are entrusted and take on responsibilities at work. Epistemic complexity will often involve uncertainty, in which knowledge-sharing and collective explorative activities are required before drawing conclusions. In this regard, trust in the work organisation and in the collegial culture may be conducive to explorative activities and for organisational learning. The strong role of the state and the tripartite system for negotiation on the national level may provide distinct opportunities also where trust in work organisations and opportunities for learning in working life are concerned (Underthun & Drange, 2018).

However, the way these characteristics of Nordic societies and working life matters for the learning of professionals and their work communities are not clear-cut. Most research on work-related and lifelong learning has focused on groups with lower formal education or qualifications, while larger parts of the Nordic workforce is engaged in knowledge-intensive work (Tikkanen & Nissinen, 2016). Their work environments are exposed to changes and new demands, as their fields of expertise and ways of organising professional services are evolving. Adding to this the well-developed digital infrastructures and generally high level of digital skills identified in Nordic societies (Nordic Council of Ministers, 2015), we could argue that a perspective on organisational learning that accounts for more complex epistemic environments is much needed. In the next section, I first discuss how relations between professional practices and organisational learning in evolving expert cultures can be conceptualised from an epistemic practice-perspective. Then, I present and discuss examples from studies of professional work in the education and health sectors in Norway.

Organisational learning through changing knowledge practices and relations

Organisational learning is about changes in how knowledge is generated, shared and recognised as valuable—that is, the collective practices of knowledge and knowing—in the organisational environment. These practices are termed *epistemic practices* because they are specifically oriented towards working with knowledge. Moreover, they take distinct forms in different expert communities. Following the theorizing of Knorr Cetina (2001; Knorr Cetina & Reichmann, 2015),

epistemic practices denote the practices by which knowledge is generated and shared in a given field of expertise. These practices are distinct to, and nourished within, specific epistemic cultures such as the sciences or the professions. In the field of education, Kelly and Licona (2018, p. 139) propose the following definition: '[Epistemic practices are the] socially and interactionally accomplished ways that members of a group propose, communicate, justify, assess, and legitimate knowledge claims'. Both definitions highlight the structural and collective character of epistemic practices as recurrent and stabilising features in expert communities. They play a critical role in knowledge sharing, as well as in the enrolment of newcomers to the community (Jensen et al., 2015; Markauskaite & Goodyear, 2016). At the same time, epistemic practices are transformative in the products they generate and the effects they have in social and professional life. As Barad (2007, p. 91) puts it, 'the point is not merely that knowledge practices have material consequences but that practices of knowing are specific material engagements that participate in (re)configuring the world. Which practices we enact matter-in both senses of the word'. In sum, these perspectives and definitions point to the need to attend to the level of practice in discussions of organisational learning and to acknowledge the multiple social and material relations that bring epistemic practices and learning into existence (Cuel, 2020; Nicolini, 2013).

In our research environment in Oslo, a group of senior colleagues and PhDs have employed these perspectives in studies of professional work and learning in different professions. Our interest has been in the relation between epistemic practices and evolving professional knowledge cultures, rather than in organisational learning per se. However, as noted above, we see such practices as collective, knowledgeable ways of working with knowledge that are shared in the profession and manifest in various work organisations. Although enacted by individuals and groups, knowledgeability is thus a collective and socially sanctioned phenomenon. The norms and criteria for what is recognized as knowledgeable ways of doing are often shared across sites in the profession, and related to the circuits of knowledge in the field of expertise. Hence, organisational learning can be seen as a matter of relating epistemic practices in the local work organisation to wider knowledge circuits.

One set of studies has examined the knowledge work of teachers, primarily in lower secondary schools. In Norway, this profession has experienced a range of change initiatives during the last decades in terms of school curriculum reforms, changes in professional education and the way schools are organised and governed. Several of these changes underscore an increased focus on knowledge work. For instance, teacher education programmes have been upgraded to master's level programmes aimed at strengthening capacities for research and development work. Furthermore, curriculum reforms in schools are introduced with an emphasis on local autonomy, through which

teachers are mandated—and entrusted—responsibilities for collaborative development of knowledge and practice in their respective schools (OECD, 2019).

Over time, our analyses have shown increased epistemic responsibilities in teachers' work. In the early 2000s, we depicted teachers' knowledge culture as characterised by locally bounded knowledge sharing around practical problems of teaching, in which experience-based knowledge was given priority within primarily spoken face-to-face communication (Nerland, 2012; Jensen et al., 2022). At this time, teachers' responsibilities for knowledge generation and engagement in epistemic practices were found to be limited. Some years later, analyses of teacher teams who were mandated to develop new assessment guidelines and practices in their schools showed a growing orientation towards practices and actors in other settings, with emerging infrastructures and materials that supported knowledge sharing across settings. In the process of developing assessment schemes and guidelines, teachers became involved in a set of explorative and knowledge-generating practices through which assessment criteria, materialised knowledge and tools were examined. The development work was carried out through a range of epistemic practices that involved teachers in assessing, testing out and generating knowledge that was further shared in the community and integrated into local routines (Hermansen, 2016, 2017).

In recent years, analyses from an ethnographic study of teachers' collaborative curriculum development have shown how the epistemic complexity and demands placed on teachers are growing in the sense that they engage in the iterative construction of curriculum objects over time; through this construction, a series of knowledge dilemmas and stakeholder relations are negotiated (Tronsmo, 2020; Tronsmo & Nerland, 2018). These relations and responsibilities bring extended roles and responsibilities to the fore and provide expansive learning opportunities for teachers through their engagement in epistemic practices. In the school where this study was conducted, the opportunities were distributed widely and with low power distance; a team-based organisation of work was employed, in which all teachers were expected to contribute. Moreover, these practices link actors and sites in the expert culture and facilitate knowledge sharing within and across organisational boundaries (Jensen et al., 2022).

Another context for our research is the health sector. This sector is marked by a range of digitalisation initiatives, which alter the distribution of tasks and responsibilities and bring new demands to professionals' competencies (Lupton, 2018). While there is a lot of literature addressing work and learning in the health professions, there is a need to understand better how different types of technologies and their contexts of use provide distinct opportunities and challenges to learning. One type of digital resource we have addressed is clinical guidelines and procedures for nurses' work.

Analyses show how the local work with developing and approving such guidelines depends on a range of epistemic practices to integrate new procedures in the local environment. Groups of nurses mandated to assess and adopt guidelines to their local work contexts engaged in collective ways of exploring, assessing, critically examining and justifying knowledge claims (Nerland & Jensen, 2012). In these practices, the guidelines were explored; imaginarily tested for their relevance in specific care or ward settings; and approved and adapted or rejected. These practices formed a core dynamic in professionals' work-based learning as their attention moves between what is known and what remains to be explored or improved.

In later years, digitalisation processes in health care are growing in ambition and are often related to new partnership models and increased user participation. The aims of digitalisation initiatives become more comprehensive and interlinked with ambitions for organisational change, for instance with intentions that the technologies should support both the performance of care practices and contribute to analytics and data-driven development of the services. In the ongoing project CORPUS[ii], we examine work and learning in settings where new technologies for service coordination and delivery have recently been designed, implemented or reinvented for specific use. One part of the project follows the design, development and implementation of a digital technology to facilitate information flow and coordination between units in primary health care when patients move between units (e.g., from hospital to home care). Another part of this project follows knowledge sharing and collaborative practice development in settings where new care technologies are taken into use in clients' homes and changes the way health services are provided. Preliminary analyses[iii] show how digitalisation processes imply manifold new tasks and responsibilities for healthcare workers, which to a limited extent is made explicit. Healthcare workers who take part in the design of new technologies for patient information sharing become engaged in exploring the larger work system in which tasks and care services are embedded, and in constructing categories and assessing the relevance of different patient information in different contexts of use (Sadorge et al., 2021). As representatives for prospective users of the technology, these professionals are challenged to construct and make use of different spaces for action to bring their expertise forward as a collective resource (Dæhlen & Grisot, 2021). Professionals who are given coordinating responsibilities when new technologies are taken into use in the care services face extended responsibilities related to navigating relations between different organisational functions and layers, as well as involved actors. Moreover, they play a key role in balancing the continuity of work while at the same time exploring new opportunities and facilitating the development of services (Brandenberger & Hasu, 2021). In both these examples, we see a need for explorative and investigative practices as well as a need to align new concerns and ways of working with historically established ways of knowing and doing.

When approached in specific practice contexts, technologies tend to turn into epistemic objects whose multiple opportunities for interpretation and use spur further investigation and a need for the reconfiguration of the practice and the tool itself (Nerland & Hasu, 2021). These modes of engagement go beyond instrumental use: They form a core dynamic in practitioners' work-based learning as they move between what *is* and what is *yet to be*, or in other words, what is known and what remains to be explored or improved. With these moves, knowledge and technologies become questioned in ways that generate organisational learning.

Discussion

In the examples presented above, changes in collective and knowledgeable ways of doing were highlighted in relation to specific epistemic environments. Furthermore, such changes were related to an extension and redistribution of tasks and responsibilities, which involve professionals in epistemic practices that matter to organisational learning. The practices differ in their human–material configurations and relate to different forms of epistemic complexity.

In the examples from the teaching profession, the complexity of the environment was related to new actors and stakeholder relations aimed at influencing teachers' work, as well as to increased formalisation of knowledge sharing through material tools and infrastructures. These two aspects seem to have reinforced each other over time, providing productive conditions for professional and organisational learning through the way local work practices are linked to the wider expert culture (Jensen et al., 2022). Importantly, the way work is organised and the relatively low power distance that characterises the teaching profession seem to allow large groups of professionals to take part in explorative and constructive practices. These practices may enhance organisational learning on different layers because they stimulate collective and knowledge-generating activities in the work organisation (Anthony, 2018). Furthermore, such forms of engagement are nourished by the wider institutional and political context. Schools in Norway are granted relatively high autonomy; teachers are entrusted responsibilities for collaborative knowledge work and required to fulfil them (Hatch, 2013; OECD, 2019). These features may be related to characteristics of professionalism in Nordic societies because research-based teacher education at the master's level is emphasised in several Nordic countries and the significance of teachers' professional development is acknowledged. At the same time, there are differences between the Nordic countries and their approaches to teacher education and professional development; hence, a consistent Nordic model is difficult to foresee (Wollscheid & Opheim, 2016).

In the examples from the health sector, epistemic complexity was related to the way digital technologies bring new knowledge, tasks and responsibilities to the fore. Moreover, digitalisation

processes often co-evolve with initiatives to coordinate patient-centred care and support user involvement, which implies reorganisation of the services. Healthcare workers participate in practices oriented towards developing new ways of working and collaborating with clients and colleagues. At the same time, the organisational contexts we have examined differ in the form of epistemic practices and in how responsibilities are distributed. The development of clinical guidelines and procedures was organised around clinical guidelines groups in which selected nurses and health personnel took part. In addition, in the ongoing CORPUS project, we observed how some professionals are given responsibilities as knowledge brokers and implementation agents when care technologies are introduced in the services—often through emerging working roles, such as the 'welfare technology coordinator' (Brandenberger & Hasu, 2021)—or as implementation agents in specific service contexts (Dæhlen & Grisot, 2021). These professionals are entrusted with epistemic and organisational responsibilities, and they are mandated to facilitate organisational learning. Through these tasks and responsibilities, they become deeply involved in explorative activities and take part in reconfiguring not only the technologies but also the services in which they are embedded.

One could ask whether this distribution of responsibilities to specific work roles implies that learning opportunities remain unequally distributed in the organisation and that some practitioners have limited space for explorative engagement in their everyday work. The health sector is marked by stronger organisational hierarchies and division of labour than what has been the case in the education sector. When digitalisation is a driver of epistemic complexity, it often comes with an emphasis on standardisation, which may restrict spaces for action on the ground floor. Internationally, studies have argued that there is an increasing gap between the high and low skilled regarding how the 'digital revolution' affects their work, where it is claimed that groups of high-skilled workers experience increased autonomy, decision-making power and creative forms of work, whereas lower skilled workers may find work more precarious and subject to stricter standards and control (Ivaldi et al., 2021). At the same time, the way in which digitalisation initiatives bring about a need to reconfigure roles and responsibilities in health services will imply that practices are changed and need to be (re)stabilised on many layers in the organisation, and therefore, they affect most workers. Studies from related Nordic contexts indicate that professional communities in elderly care have been strengthened in later years through a redistribution of complex tasks from specialised hospitals to home-based care, an emphasis on rehabilitation and work aimed at supporting self-care among clients and increased levels of formal education among healthcare workers. One example is the work by Hansen and Kamp (2018), who discuss a set of research contributions and describe how professionals in elderly care are now encouraged to adhere to formal and specialised knowledge as a

basis for work, which may generate an epistemic drift in the work community. In our studies, we have observed how primary healthcare workers are asked to take part in design and development activities that target tools and technologies to be used in the services, as well as the organisation of the services as such.

Whether the characteristics of Nordic working life provide specific conditions for professional learning is an interesting question that cannot be fully answered based on the above described studies. Granting more responsibility and autonomy to workers is seen as important for generating continual learning and organisational improvement in the wake of technological and social change (Ivaldi et al., 2021, Simons & Ruijters, 2014). The examples provided above suggest that many professionals in the Norwegian education and health sectors are granted such opportunities. Moreover, in both professional contexts, we see signs of more variegated career paths, for instance, through new working roles as technology coordinators and project leaders. These workers are not merely following a specialisation path in developing professional expertise. Rather, when epistemic environments become more 'multi-charged' (Knorr Cetina & Reichmann, 2015), there is an increased need to negotiate various concerns and interact with various stakeholders. Following the argument of Noordegraaf (2020), this requirement may lead to a reconfigured mode of professionalism in which the way professional practices are continuously related to other actors and practices outside the professional realm is a key to sustained and entrusted professional expertise. Such 'connectivity work' is demanding and requires a thorough understanding both of one's local work practices and of the wider social and epistemic relations with which the local work is entwined. An interesting question for further research, therefore, is whether the Nordic ways of organising professional education and work provide distinct conditions for connective professionalism to be realised. Prolonged educational trajectories and opportunities for learning at work may provide a better understanding of service contexts and their various actor constellations. At the same time, strong specialisation tracks within professional education and work may create boundaries between work practices and communities and cause challenges in professionals' capacities to navigate multi-charged settings and handle various forms of epistemic complexity.

Another question to explore in future research is the balance between responsibilities and learning expectations placed on individuals and communities. More complex epistemic environments imply less stability in collective ways of knowing and doing work. While such environments generally encourage organisational learning, one may ask whether the expectations of learning among individual professionals can become too strong, especially in organisations marked by flat hierarchies and low power distance. Must everyone embrace the identity of the learning and career-aspiring professional in today's working life? Nordic societies are described as demanding when it comes to

work participation, a phenomenon that can be explained by the high proportion of knowledge-intensive work and its related high skills requirements, among other things. Many professional work roles come with unclear boundaries for responsibilities and engagement, leaving it to professionals to prioritise own needs and decide when tasks are sufficiently accomplished. One could imagine a tipping point between demands and opportunities for learning in everyday work contexts. Therefore, to develop organisations for a socially inclusive working life, we may ask whether more differentiation in learning demands—and not only in opportunities—is important for the time to come. This would require awareness and strategic work on the organisational level, in which the evolving expert culture and its emerging complexity are accounted for and collectively handled.

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[i] This understanding of knowledgeability is to some extent in line with the conceptualisation of Wenger-Trayner, as it highlights how knowledgeability is negotiated within a broader landscape of practices and communities (see Omidvar & Kislov, 2014). However, it places a stronger emphasis on the evolving professional expert culture as the wider context in which collective knowledgeability is recognised and become transformed.

[ii] CORPUS is a four-year project running until March 2024, as a collaboration between researchers in the Departments of Education and Informatics at University of Oslo. See the project webpage for more information: https://www.uv.uio.no/iped/english/research/projects/nerland-corpus/

[iii] Analyses of data from the CORPUS project are still in progress. Preliminary analyses are presented in the form of conference papers referenced here, which will be developed into full publications in 2022.