Professional tacit knowledge sharing in practice. Agency, boundaries, and commitment

Maarten Matheus van Houten

School of Education, College of Social Sciences, University of Glasgow, Glasgow, UK

Abstract

Purpose – The purpose of this study is to gain insight into the dynamics and considerations of professionals regarding the sharing of tacit, personal knowledge in their practice.

Design/methodology/approach – Adopting a social-constructivist ontology, the qualitative design deploys semi-structured interviews and focus groups. Data were coded, and analysed through interrelating and reasoning.

Findings – Personal knowledge is difficult to share precisely, but can be shared to some extent using reflection and stories. Knowledge also provides a position and professional agency, emphasising boundaries and impacting the decisions on interaction and sharing. As such, professional commitment is vulnerable and contextual and, by extension, material becomes part of this interplay of professional practice and collaborative development.

Research limitations/implications – Findings imply that exchange and use of knowledge and material present in organisations are impacted by individual professionals' autonomy and decisions, which consequently impact on employees' practice. This calls for research that focuses on individual factors such as autonomy, professionalism and attitudes in addition to organisational and facilitative matters.

Practical implications – Stimulating professional commitment and interpersonal learning is a matter of valuing personal knowledge and practice to avoid protectionism, boundaries and segregated agency. Management and professionals should consider how and why individuals exchange their personal knowledge, paying attention to social structures and individuals' voices and objectives in forming communities.

Originality/value – This study combines the concept of tacit knowledge with the younger field of practice theory. By connecting personal knowledge to practice, it extends agency to the material world and offers a more individual perspective to knowledge sharing in and between entities.

Keywords Tacit knowledge, Knowledge sharing, Practice, Learning organisation, Agency, Professional commitment

Paper type Research paper

Introduction

This paper revisits the concept of tacit knowledge (TC) as developed by Polanyi (1958), combining it with the more recently emerged field of practice studies. Tacit (or personal)

knowledge can be described as the individual affirmation and appraisal of truth or reality, context and experience, which are dependent on personal sets of criteria that establish one's interpretive framework. It concerns a personally constructed blend of knowledge and experience, often developed over years of professional practice. Although professions are comprehensive and consist of various contexts, actors and elements, practice has been used as an umbrella term to represent professions and related behaviours. Practice theories place practice at the centre of study as a "building block of the "social" and a key object for research studies" (Reich and Hager, 2014, p. 420) and with that provide an interesting and useful angle to interpersonal knowledge sharing and learning.

As our knowledge-driven world sees "a greater reliance on intellectual capabilities than on physical inputs or natural resources" (Powell and Snellman, 2004, p. 199), flexibility, agile working, knowledge and creativity are gaining importance over routine jobs and industrial production (Livingstone and Guile, 2012). A neoliberal condition has become prominent in many domains such as business, industry, HRM and education, emphasising competition, performance and the importance and value of knowledge (Huber, 2016). Knowledge sharing and information and knowledge management (KM) are important features in this context, as knowledge has become a main asset of organisations (Levy, 2011). Against this background, research in KM has studied TC and knowledge sharing, often focusing on instrumentalised, performative knowledge, not seldom overlooking TC in interpersonal practice – which is an omission as "experiential understanding of what is required when engaging with clients, colleagues, partners, and the political contexts in which employees work is central to tacit knowledge" (Garrick and Chan, 2017, p. 875). Moreover, KM and knowledge sharing are often approached from a group or organisational perspective, with that underestimating the role and impact of individual behaviour.

The current study was conducted in the education sector, which, along with health care and social work, is a sector in which TC, KM and collaborative professional development are prominent features. These contexts require professionals to possess not only a thorough knowledge base but also experience and personal knowledge to perform well. Teachers' practice not merely involves transferring knowledge and skills to students, but also for instance social and communication skills, teaching and classroom management techniques and critical thinking skills. They are expected to possess knowledge and skills related to various matters, which include pedagogical and didactical ones such as (challenging) classroom management, racism, learning disorders and poverty, and issues regarding curricula, work field, examinations and national and local regulations. Practical knowledge then relates to, for example, communication, teaching techniques, reflection, content knowledge regarding subjects taught, group dynamics and interpersonal behaviour, which are all needed on a daily basis in teaching and being an educator and professional in the organisation. Meanwhile, standardisation processes, managerialism and a focus on organisational professionalism decrease teachers' professional discretion and complicates practice and daily performance (Brodkin, 2011; Ottesen and Møller, 2016; Ponnert and Svensson, 2016). Ball (2009) describes the emergence of companies retailing policy solutions and "improvement" directly to schools, which includes the selling of professional development, training and support. Such developments illustrate how neoliberal conditions, including performativity and KM, grow from inside the organisation, as well as how the organisation is being subjected to these (also see Patrick et al., 2003).

By deploying the conceptual reasoning of TC with the more recent theoretical approaches of practice theory, this paper examines the dynamics and considerations of professionals regarding the sharing of their personal knowledge in the context of their workplace practice. Concentrating on professionals and their workplace practice, the

primary focus of this paper is the relationship between individual professionals and their personal knowledge on the one hand and the sharing of this knowledge in the organisation on the other, guided by the question *How do individual professionals impact knowledge sharing in practice*? The introduction continues with four sections:

(1) one on the concept of TC;

(2) one on practice theory;

(3) one on collaborative learning; and

(4) one on knowledge sharing in practice.

Tacit knowledge

In much research and organisational contexts, TC is theorised as relating to performativity (Garrick and Chan, 2017). This is understandable in a condition coloured by competition, production and KM. However, this narrow view of TC emphasises economic value over, for instance, behavioural or developmental value, which in schools and healthcare are not insignificant. As the current study focuses on individual professionals and their interactions in the organisation, it is inappropriate to reason from the assumption that individuals axiomatically share or disseminate their knowledge for common productivity. Moreover, this would not align with the concept of TC itself, because TC is personalised knowledge that by nature is implicit and not easily explicated and shared.

Polanyi (1958), questioning truth and objectivity, explored where these originate from, resulting in an alternative view on (scientific) knowledge. Common thought was that knowledge was impersonal and universal (factual), but Polanyi considered knowledge to be less objective, reasoning that people often uncritically and unknowingly "accept a certain set of pre-suppositions and use them as their interpretative framework" (Polanyi, 1958, p. 60) and identify themselves with such pre-suppositions. This framework is the result of numerous personal experiences and individuals use their personal framework to make sense of information, to assess and to give meaning. By doing so, they instil "personal participation on the resultant knowledge" (Polanyi, 1958, p. 60), and consequently, this process renders subjectivity within any theoretical or rational product or outcome. Using terms such as "personal knowledge" and "tacit" to indicate this type of knowledge that is unique, individual and "coloured" resulted in a distinction between explicit knowledge (that can be explicitly articulated and shared) and TC, which is implicit, encrypted within a person. Polanyi often uses "personal knowledge" and "tacit knowing", holding that "knowledge is an activity which would be better described as a process of knowing" (Polanyi, 1969, p. 132).

Teachers cope with the demands of making uncountable swift decisions by using their TC and the "micro-strategies" developed over time (Huberman, 1993) that can be retrieved without the use of conscious thought. This generally enables them to act rapidly, adequately and based on experience with previous similar cases. An example of teachers' TC concerns interpersonal relations, which include communication and empathy and are necessary for teaching and interaction with colleagues and students. Elliott *et al.* (2011, p. 98) show how:

> Experienced teachers and novices do not differ significantly in terms of the capacity to identify good solutions to situational problems, but rather differ significantly in theirs kills at identifying poor solutions to these same problems, suggesting that tacit knowledge also is about (learning) how to avoid making a bad decision or move.

Torff (1999) discusses folk pedagogy and folk psychology as typical areas of tacit teacher knowledge related to interaction, especially in a specific context or region. Other examples of areas that can be considered TC in teacher practice are educational jargon, instructional methods (Shim and Roth, 2007) and knowledge about specific pupils or students or their cultural backgrounds (Dudley, 2013).

As (personal) knowledge resides in individuals and organisations want to retain and tap into that knowledge base, KM extends itself to professional learning contexts. To share and manage TC, however, it has to be transferred and sometimes explicated to reach other professionals or teams. Although TC is considered encrypted and personalised, there is evidence that metaphors, analogies and stories can be used to convey TC (Kothari *et al.*, 2011; Krátká, 2015; Shank, 2006), that apprenticeships and other ways of learning by doing can contribute to the development and transfer of TC and skills (Nonaka and Takeuchi, 1995; Polanyi, 1958) and that groups have a positive effect on evoking and sharing knowledge in general (Stoll *et al.*, 2006). Collaborative knowledge sharing and learning, hence, can fulfil a central role in KM and the sharing of TC.

Practice
"Practice" has remained a taken-for-understood concept, more than a theorised or examined concept, usually co-located with classifiers that become objects of focus, such as legal, vocational, teaching and yoga (Hager, 2012; Reich and Hager, 2014). In academic and professional literature, practice is used as a verb indicating "doing" or "performing" and as a noun suggesting "professional practice" as performance in the work context. Antonacopoulou (2008) identifies various conceptualisations, such as practice as action, as activity system, as social context or as knowing. For example, teaching practice can involve pedagogical and didactical performance, health-care practice includes clinical examination and surgery and general workplace practice may concern procedures and intercollegial communication. Conditions for (professional) practice have been changing quickly in the wake of globalisation, approaches to KM and production, and economic-political pressures and conditions such as neoliberalism and accountability (Evetts, 2009; Fenwick and Nerland, 2014; Ottesen and Møller, 2016), showing how "practice" itself is a domain for research. Practice theories, which revived after the "practice turn" (Schatzki, 2001), place practice at the centre as the key social context for research, including more exclusive approaches (stemming from specific academic disciplines) and more inclusive approaches that involve actions and activities, both mental and physical, as well as non-human objects (Hager, 2012).

Within practice studies, knowing-in-practice refers to a situated, collective process that connects knowing, working, organising and learning (Hager *et al.*, 2012; Reich and Hager, 2014). Fenwick and Nerland (2014, pp. 3–4) describe that whereas professional or workplace learning has conventionally been considered an individual and person-centred endeavour focused on personal experience and the development of adequate competencies, professional learning in the context of practice theory is about the environment. Knowledge is situated in practice, and learning and practice are situational and relate to social structures and communities. This emphasises the role of interpersonal communication and interaction and acknowledges how knowledge can be implicit and embedded in practice, reflecting Polanyi's writings and the concept of TC. The idea that practice involves knowledge, learning and a workplace context, implies that collaborative learning and sharing involve a network of some kind, including both the human and non-human. Sociomaterial approaches in practice theory specifically focus on both the human and social aspects of practice as well as on the material aspects, such as tools, technologies, products, devices and objects that are embedded in the immaterial and human world, *without viewing these as being unrelated to people* (Fenwick and Nerland, 2014). From this

perspective, knowledge is not a possession or product of individuals in an organisation, but a more practice-situated activity subject to interpersonal processes of mediation, collaboration, and use of expertise, the body and material (Gherardi, 2009; Manidis and Scheeres, 2012). Linking TC and KM into the sociomaterial sphere of practice, a tangible way to foster exchange and management of knowledge is the elaboration of (conceptual) artefacts – written or otherwise concrete products such as manuals or procedures, documented ideas, visions or frameworks for further learning or practice.

Knowledge management and collaborative learning
As a consequence of increased attention to KM, professional development has become common practice in many organisations in an attempt to symbiotically expand the knowledge base and remain competitive, partially through exchange of knowledge and material between employees. This does not apply any less to education institutions. Meanwhile, the combination of performance and competition in professional practice may result in, among other dynamics, a tension field for sharing or withholding knowledge, materials and products. Given an increasingly competitive context and the value attributed to knowledge, sharing knowledge for the benefit of someone else's practice is not an axiomatic matter.

This context resulted in attention to collaborative, intercollegial exchange and learning. The concept of "communities of enquiry" is constructed within the context of organisational theory (Senge, 1990) and refers to a group of people who work together on a consistent basis through enquiry into matters of importance to them or their work context. Over the past two decades, much has been written about communities of professional learners, often referred to with terms as "professional learning community" (PLC) (Senge *et al.*, 2000; Stoll and Louis, 2007) or "community of practice" (CoP) (Wenger *et al.*, 2002). Such communities are usually seen as vehicles for learning in groups within education institutions and for establishing contexts for collegial and educative interaction aiming at professional development (McCotter, 2001). Although PLC and CoP are often used synonymously or interchangeably, the two are not the same (Blankenship and Ruona, 2009). Generally, PLC concerns professional knowledge and identity and working and learning within learning organisations, whereas CoPs are formed by practitioners who share a common concern or interest and connect voluntarily and more flexibly. However, there are some assumptions underlying this *modus operandi*. One is that the professionals involved see their group as a *collective* enterprise. Additionally, it is assumed that the interaction is *aimed* at exchanging and developing. This would imply some kind of purpose, whereas sharing can also take place incidentally or more flexibly. Therefore, as interpersonal exchange requires actual interpersonal interaction, organisations approaching professional communities from a KM point of view need to be aware that for such a culture, values such as openness and willingness to share are crucial (Köhne *et al.*, 2006).

Knowledge exchange in practice
Although a culture of collectiveness and openness is important, knowledge sharing practices also require adequate, useful interaction and communication. With many studies looking into facilitative, organisational or practical aspects of knowledge-sharing practices, not seldom the individual and interpersonal dynamics and the nature of the knowledge that is expected to be shared are underestimated. Research has been suggesting for quite some time already that teachers' attitudes and behaviours are direct results of the social organisation of their workplace (Purkey and Smith, 1983; Rosenholtz, 1985, 1989) and that improvement and development of teachers within this workplace partially builds on formal and informal professional dialogue and exchange (Harris and Muijs, 2004). More recently, the importance of the social organisation of the workplace in which individuals are drawn to

collectiveness and "asked" to stay involved also expresses itself in research on and practices of shared or distributed leadership, which aim at distributing leading roles and responsibilities among different individuals and across the social structure (Daniëls *et al.*, 2019; Harris, 2008; Spillane, 2012).

The social and shared context and mindset, hence, affect knowledge sharing in the workplace. Previous research shows that effective exchange of knowledge, that is, aiming at learning and professional development, can occur if interaction builds on a shared "template for interaction" (Homan, 2001) that provides a common framework and set of knowledge allowing for understanding and growth, generally called shared mental models or team models (Mathieu *et al.*, 2000; Stout *et al.*, 1999; Widmann and Mulder, 2020). Zellermayer and Tabak (2006), for example, emphasise the importance of mutuality and overlap between one's own work and practice and that of their colleagues, to be able to interpersonally understand, reflect and support.

Apart from more general elements of such a framework such as workplace characteristics and organisational rules, other elements to consider in this respect are a focus for the collaboration (e.g. a formulated problem area), the opportunity to observe one another's practice and the chance to discuss, evaluate and reflect upon teaching with colleagues (Plauborg, 2009). Plauborg (2009, p. 33) also notes that:

> A vital limitation for teachers' learning in conjunction with team collaboration seems to be teachers' tendency to focus on practical actions and to use team collaboration as a way of extending their repertoire of actions, signaling the need for exploration, reflection, and analysis.

When professionals share and interrogate their practice in an ongoing, collaborative, learning-oriented way (Toole and Louis, 2002), they can create resourceful and fruitful environments for professional exchange and development (Verloop and Kessels, 2006) and for co-construction of knowledge (Schaik *et al.*, 2019). Professionals may do so by exchanging analogies and stories (Krátká, 2015; Shank, 2006) or collaboratively analysing a problem. Collective reflections potentially increase team learning, for which a facilitating team atmosphere seems vitally important (Ohlsson, 2013). Furthermore, bringing together multiple perspectives and experiences is believed to foster this interactive process (Van den Bossche *et al.*, 2006), and literature on education institutions as learning organisations shows a key connection between personal and interpersonal learning (Admiraal *et al.*, 2021). Relating to the retainment and transferability of collaborative learning, research shows that the process is benefited by exchanging and co-creating experiences, products or ideas (Nonaka and Takeuchi, 1995; Polanyi, 1958) and that documenting the results of professional learning consolidates results of exchange and development, leading to improved practice as well as future use of learning outcomes (Bereiter, 2002; Tillema, 2004; Vescio *et al.*, 2008).

Methodology

The study context entails two vocational education institutions in a western European capital city in which professionals work with a certain degree of professional discretion, while being member of their team or department. The participants had at least two years of experience in this sector, and worked in various teams and departments. This means that they share a physical environment, may serve the same groups of students, often work under the same manager and director and sometimes rely on shared material such as course material and curricula. It also implies shared meetings, for example to discuss student progress or develop material. Yet, in their teaching and daily practice, the participants have significant freedom to direct their own behaviour, interaction and collaboration.

As do studies and concepts described earlier, the current study too assumes that social and cultural conditions shape individuals, with the "self" functioning in relation to social process and the human environment. Social constructivism, which assumes that knowledge is constructed and manipulated in social contexts, forms the ontological cornerstone of this study. Therefore, studying individuals and their interaction requires a research approach that allows participants to openly share their insights. The qualitative design aims to identify ways through which (relationships between) individuals operate by collating and analysing rich data to infer meaning (Magrath *et al.*, 2019), aiming for in-depth explorations of issues in real-life settings in which the researcher has little control (Crowe *et al.*, 2011). The primary instrument is the interview, to try and uncover individuals' private, sometimes incommunicable, social worlds through establishing a conversation with sharing stories and experiences (Edwards and Holland, 2013). The specific form chosen is that of semi-structured interviews, allowing for flexibility and an open approach, while maintaining some direction in the conversations using pre-set topics (Boeije, 2014). The main topics for the individual interviews concerned articulation of (tacit) knowledge, intercollegial interaction, knowledge sharing and professional learning/development. Ten teaching professionals working in secondary vocational education were interviewed in individual interviews of approximately 1 hour each.

In addition, focus groups were used, allowing for data collection and the examination of social interaction and preliminary results (Curtis *et al.*, 2014). Two focus groups of four participants were held, one in each of the two institutions involved, with the participants being different people from those of the individual interviews, yet working in the same context and institutions. A preliminary analysis of the individual interviews showed a professional context in which individuals, in some cases, were willing to explicate and share but often were struggling with making their experience and practice explicit, while also showing hesitation concerning their interaction and sharing: when, how and with whom? This served as input for the focus groups, in which three central themes were discussed. Further exploration took place concerning:

(1) communication and formulation of knowledge;

(2) facilitation; and

(3) appreciation and interaction between colleagues.

Preliminary results in the form of statements or direct quotes from earlier participants (interviews) were used to trigger focus group participants and elicit their thoughts and feelings on these themes. In a 1.5 hour discussion, the themes were discussed, critically reflecting on participant's thoughts, choices and behaviour, while collecting examples.

All participants gave written informed consent and conversations were recorded with consent. Names have been anonymised, and focus-group participants were made aware of limitations to anonymity. Some participant quotes are referred to with gender, age and/or function to diminish recognisability.

The analysis, based on interview fragments and codes, used interrelating and reasoning (Saldaña, 2014) to consider how fragments and codes may interact. First, fragments were coded based on mere content; then, fragments were interpreted in the context of the topic discussed and assigned an interpretive note, after which fragments and quotes from various interviews were grouped and summarised. By analysing and comparing content, connections were sought within, between and among codes, while reasoning was deployed to unravel causal probabilities, summarise and evaluate. To provide an example, one participant shared how they viewed the organisation as a "ship filled with knowledge". Initially, this was coded with

"knowledge" and "organisation". Within the context of knowledge sharing and collaboration the conversation was about, interpretation resulted in a note added: "knowledge is in organisation/compartments/teams/people". With other participants in their interviews also discussing interaction between individuals and teams, analytical reconsideration with a social constructivist-informed lens resulted in the note "knowledge is stored in individuals that *may* interact in the organisation", adding meaning to the fragment and allowing for fragments from various interviews to be combined. Such analysis reveals connections that concern the sharing and dissemination of knowledge (interrelating) and relationships that could be summarised as "the knowledge base in the organisation exists between individuals that govern and manage knowledge, material and relationships" (reasoning).

Results
Nature of knowledge
Before exploring what the process of communicating TC may look like, it is useful and supportive to cast some light over the areas of knowledge that were identified in the data. Participants mentioned various domains of their practice knowledge, ranging from more concrete knowledge to events and experiences. First, findings are presented, accompanied by participant quotes and remarks, after which an interpretation follows.

Without exception, all participants spoke about rules, procedures and other forms of habitual structure that facilitate everyday work and care for students. Frequently mentioned were curricula structures and course content. Software and administration systems were also mentioned by several participants. For most participants, such procedural knowledge appears to be dominant. As Saskia explains:

> System-atic learning is stimulated – so: all the rules, codes, policy aspects [. . .] But if it concerns nourishing the mind, inspiring, and discussing educational innovation and the field, I consider it very to be very limited.

Knowledge about the organisation, such as procedural knowledge and information regarding qualification structures and examination, often comes from management or other colleagues, especially those who are more knowledgeable on the matter. This may take, for instance, the form of a presentation or a guideline.

A second recurring area concerns pedagogical and didactical knowledge, as it expected that teachers have knowledge of didactics and pedagogics, how these work and group dynamics (Senior female teacher). Participants often referred to formal education and training, such as initial teacher education ("my studies"), books, lectures, other trainings and education (for instance, master degree programmes and internal trainings organised by the organisation).

Another domain concerns knowledge on the content of the education programs. Tony explains: "I think have the most recent knowledge on anatomy and pathology and that I am able to provide clear examples from practice". Although not surprising, participants consider knowledge on subjects taught crucial.

The last area is that of communication and didactics, classroom management and teaching methods. Participants talk about how this knowledge is blended with experience. Khalid (34) illustrates: "I notice how working in primary education has made me better in didactics", and Mira (senior teacher, 57) shares that when she started teaching, she "had no knowledge of didactics at all, but did know how to reach adolescents, because that was the population within nursing where I worked and carried out observations".

Analysis of both the individual interviews and the focus groups shows that professionals' knowledge can be divided into two categories. One concerns factual, content-based knowledge:

knowledge regarding *what* to say and do in the organisation. The other contains knowledge of a more experiential, skill-based nature: *how* to perform and behave. The two categories (content versus process) are distinctive, yet interwoven. Participants distinguished between the two, but mentioned various domains they possess knowledge on in a seemingly random order and often combined both types of knowledge within one example from their practice, such as classroom management. Process knowledge, as one might expect, has a less explicit and concrete source than content knowledge. Certainly, a foundation can be found in professional and academic studies and other resources offering explicit advice and examples. That way, knowledge gained in studies and other forms of training often acts as background knowledge and referral framework, participants indicated. It is the foundation for experiences to build on. One male participant believes he is "very conscious of what I have built up in the past, which is the basis I now work with. It is where my knowledge is based upon". Later on, experience itself becomes a source of knowledge, as reflecting on events renders insights. As such, it could be considered a synonym for TC. Results show how professional performance often is a process with limited or no awareness of the knowledge and skills being used, with various participants indicating that "a lot just happens on autopilot".

Communication and articulation of knowledge
Experiences in the work context are found to provide important impetuses for professional development and exchange. In many cases mentioned by participants, this learning is preceded by or based upon negative experiences. Participants such as Ågnes talked about the need for reflection to unearth what happened when things went "wrong":

> And a lot happens on autopilot, when I am absolutely not busy with what I could do better or not. And that goes fine. And when I am on autopilot and things go wrong, *then* I will reflect.

Learning also takes place during interpersonal conversations, indicating that language and verbal communication are important vehicles for knowledge sharing. A colleague's or friend's thoughts, ideas and experiences allow for comparison and a critical lens, which is sharply reflected by Tony, saying that such conversations are "a form of reflection of course, and it is like a mirror you need in the form of the other person". This implies that sharing experiences scaffolds interpersonal (learning) conversations by providing input for reflection. A general belief that can be extracted from the data is that this "reflecting mirror" is able to lift up the blanket that is covering the knowledge, that way exposing elements of TC.

Asked how they attempt to articulate and share knowledge, most participants elaborated on their attempts to unearth knowledge by compartmentalising the matter they want to convey, that is, breaking it down into pieces that are identifiable and communicable, preferably accompanied by examples, such as with the course *Sports and Movement*:

> I am quite lucky to be able to use the students' musculoskeletal system. So if I wanted to explain theory, I do so guided by examples. That is just really practical (experienced teacher, male).

Analytically reviewing some examples from participants, it was found that some do this unearthing of knowledge in a "constructive" way by identifying and elaborating on elements that together form their concept, while some prefer an "unravelling approach", first providing the concept and then breaking this down into pieces in front of the audience.

Value of personal knowledge
Findings indicate that professionals are interested in knowledge and advice only if they can benefit from it, meaning it would support their performance and practice. Put differently: shared knowledge carries value if it has a base in adequate experience. The value of what is

shared by a colleague "depends on the topic. If it concerns knowledge related to their position, then it matters" (Robin, 28). During her interview, participant Irene indicated that she considers it important that someone "is able to convince me that it will bring me something" – she prefers proof and results over "just another story". Other participants, too, used words such as "effective", "functionality" and "applicability" when explaining how they judge on knowledge and advice. If experience or adequacy are lacking, a colleague's message loses power and meaning.

Participants noted benefits for workplace learning and practice of exchanging their personal knowledge and expertise with others. Improving practice (certainly their teaching) was the most prominent benefit and prime motivation to engage in interaction. However, as knowledge at times becomes explicated (including personal knowledge when integrated in, for example, a manual or guideline), considerations regarding interaction and sharing behaviour extend to the material world. Many participants shared concerns when asked if they wanted to share always, everything and with anyone, and this cautiousness finds a base in the "huge investment in your job" (Ann, 59). Some participants were in doubt and expressed their concerns implicitly (raising eyebrows and mumbling), while others explicitly talked about their contemplations, such as participant Nora:

> Material, for example – nowadays I do it more often – but actually I never put it on the website. […] I find it irritating to share, because I know that some people do nothing, and benefit from my material.

Interpreting the findings and participants' remarks, it shows that knowledge is considered useful when it enriches one's professional backpack and, with that, offers opportunity to become a better performing professional. However, it also shows that sharing does not take place on demand. Analysis reveals a large degree of autonomy when it comes to individual KM, in which individual preferences and feelings towards other professionals impact the willingness to communicate and share with others. Sometimes, participants were a bit reluctant in sharing their views on these topics, making remarks such as "I can strongly imagine this would apply to my colleagues", which implies cautiousness and awareness of underpinnings of their reasoning behind sharing. This analysis suggests that information and knowledge have not only a practical role, but also are valuable in the social (work) environment, which led to further exploration of this in the focus groups.

Possessing specific personal knowledge also renders another significant effect: this can turn an individual professional into an authoritative "hub". Useful personal knowledge provides one with a degree of authority, with prestige, which partially "consists of having knowledge and overview" (experienced female teacher). As such, personal knowledge may generate personal value. It offers a position amongst other professionals and mirrors one's value in the organisation. Consequently, it appears that individual professionals consciously consider what to share with whom, at times creating subgroups or bonds with others, or building invisible walls between teams. In the case of education, professionals often teach several subjects, which they have grown into over the years. Content, readers, presentations and teaching techniques have become intertwined, and sharing material implies sharing one's professional value. On top of this, an increasing focus on organisational professionalism (which concerns procedures, administration and accountability; see Evetts, 2009) for professionals emphasises a decrease in occupational professionalism (mainly autonomy and individual development). This, in the participants' reality, underlines the value of their personal expertise and knowledge, as opposed to information and knowledge anyone could have. The protectionism revealed implies that not only implicit knowledge or experience but also physical material (of which intellectual property and copyright often belong the organisation) may be hided or hoarded, which limits opportunities for workplace and collaborative learning.

Discussion

Tacit knowledge in performance and development

Analysis shows a distinction between content and process knowledge. Content knowledge is fairly explicit and concerns structures, materials and procedures. As Nonaka and Takeuchi (1995) point out, this kind of knowing (which they refer to as cognitive TC) involves cognitive activity, mainly because of the absorbing and remembering of factual information. On the other hand, the current study undoubtedly provides support for the existence of a more implicit, personal and embedded kind of knowledge existing within the individual. As discussed by the participants, without exception, this personal knowledge mainly relates to professional performance in practice.

Although it appears difficult for participants to depict or describe specifics of their process knowledge, they provided many examples of their practice in which they believed to be using this knowledge base. This way of working indeed may be seen as Polanyi's (1958) "skilful performance": personal knowledge and rules, unconsciously applied to professional performance in form of, for instance, communication techniques. Viewed this way, the prefix "technical" before "tacit knowledge" used by Nonaka and Takeuchi (1995) seems fit, as performance, as found in the current study, relies on skills and rules that form the foundation of techniques used to establish the process (performance). The difficulties found to express and define such personal knowledge and to provide examples of it, underline the significance of the word "tacit" in front of "knowledge": difficult to depict, strenuous to describe, yet surely present within the individual.

Participants elaborately discussed (the importance of) experiences in developing their process knowledge, but found it difficult to provide details and explicit examples of how experience translates to learning for future practice. It is this experience that, through putting experience in words and stories upon one can reflect, can be unravelled and broken down into explicit and useful insights, such as rules of thumb, tips and tricks and techniques, similar to the microstrategies as discussed by Huberman (1993). The relationship between experience and personal knowledge is also supported by the effects participants indicated to experience during their performance. Experiences help them to develop their understanding of their performance. This happens partially unconsciously – what remains afterwards are impressions and feelings about the performance, or an improved embedded understanding, sometimes referred to with "intuition".

When interacting with others, it appears that individuals rather share elements and ideas, or explicit knowledge *about* their knowledge, instead of their actual TC. This resembles Polanyi's (1958) writing about the unspecifiability of skilful performance: the performance itself and the TC behind it remain implicit. In practice, it appears that professionals are quite able to find satisfying ways to exchange what they depict as experiential or personal knowledge. Partially, this is because of the effectiveness of communication techniques used, such as stories. By sharing stories, participants try to share their contextual expertise. With that, results align with existing evidence (Kothari *et al.*, 2011; Krátká, 2015) that indicates that metaphors, analogies and stories carry TC. However, more specifically, it can be argued that stories which express ideas, feelings et cetera *represent* an individual's experience and contain "wrapped" TC, rather than *present* TC as it is. Furthermore, communication can consist of or be improved by gesturing and demonstrating.

From a philosophical point of view, there is no evidence to contradict Polanyi's (1958) claim that personal, contextual thoughts and ideas cannot by transferred one-to-one as a result of human complexity, individual perception and limits of communication. Nor does this study provide evidence that TC itself can be shared – rather, it is stories, experiences

and personal expressions that are shared. Notwithstanding this, considering that participants appear to be satisfied with what they are able to share and discuss, one can question how vital is it that TC could be transferred exactly as it is? Although this issue strikes at the heart of Polanyi's work, the significance of it in daily practice might be limited, as there are means to share personal views and insights to a satisfying and pragmatic extent. Moreover, literature and the current study's results show that professionals are able to interrogate and alter their performance making use of someone else's experiences and knowledge. The conclusion seems to be that the principle that TC itself cannot be shared holds ground, but that personalised versions of knowledge can be shared in the form of stories, metaphors and expressions of emotions, that way enabling individuals to transfer some of their knowledge.

From personal and tacit to interpersonal and material

When longer in a job, content knowledge, expertise and techniques become intertwined and, as mentioned earlier, sometimes performance is a matter of autopilot. Although material and products used are often concrete and explicit, their appropriation is a matter of skilful performance, making practice a personal matter. Moreover, material used and products developed are often results of hard work and personal investment. This is why participants spoke in terms of "my material", or "part of the curriculum I developed". They identified themselves with their specific job, tasks, techniques and material, showing proudness and ownership. Their materials and products are like a brainchild and providing access to those is not a straightforward thing to do.

Sociomaterial perspectives emphasise the role of interpersonal communication and interaction, that way reflecting the current study's social-constructivist paradigm. They also acknowledge how knowledge can be implicit and embedded in practice, reflecting Polanyi's writings and the concept of tacit or implicit knowledge. Moreover, they challenge views on (professional) learning that suggest that learning is something mainly individual and transferable as a product or object (either physical or mental). Based on the current study too, such views can be challenged, considering tacitness of professional knowledge and issues with knowledge exchange in terms of both possibilities for transfer and the impact of social relationships and contexts.

Three themes will be discussed: agency, boundaries and professional commitment. Agency emerged from the analysis given the individual degree of freedom found when it comes to sharing one's knowledge or material. Boundaries are significant considering the tension between the individual (and their personal knowledge) and the collective. The interplay between agency and boundaries calls for elaboration on professional commitment to improving practice and performance in the workplace overall.

An ABC of knowledge sharing in practice: agency, boundaries and commitment

Considering the role both social and material elements play in the reasoning and behaviour of individuals, this study reveals some interesting, novel connections relating TC and personal knowledge to the concept of *agency*. Although, traditionally, agency is related to individuals' intentions, actions and exercise of power, some sociomaterial approaches (Fenwick, 2012) extend this beyond the individual as a mere human being. The value participants in the current study ascribe to material and the influence that sharing or withholding of knowledge and material can have on practice and the social context, imply that the networks of people do not necessarily revolve around people *only*. Materiality, such as tools, techniques and manuals on technologies and systems, carries weight in the social interactions and takes in a prominent position in actions that involve intention and power,

even to the extent that one may say material can be the object of power and a source of intentional behaviour. By sharing or withholding knowledge and material and creating and influencing materiality and its distribution, individuals not only impact the network and the (stability of) social and organisational boundaries, but also exercise power and affect daily practice of their colleagues. As a consequence, by affecting the social setting, they also impact more broadly professional development, knowledge exchange and KM in the organisation.

People, material and their interactions in practice therefore can be approached as a network of agency, in which individual (intercollegial) actions reflect the value and weight of material and knowledge. The social value and weight of materiality, in a practical sense, is acknowledged by participants discussing a knowledge platform and the role of technology and systems that they, *intentionally*, may or may not use for distribution. This provides insight into how materiality is closely related to individuals and their behaviour and suggests that materiality is inseparable from human agency in the professional environment. In this study, clear examples were found of how material, such as course readers, indeed is part of practice, as it is used as both a tool for teaching practice and a means of defining one's professional position and boundaries. As part of this professional position, individuals consciously share their knowledge and material with some colleagues, or withhold it from others or a central database. As such, practice takes "shape at the intersection of complex social forces, including the operations of power" (Hager *et al.*, 2012, p. 4).

Because of issues such as protectionism and professional position within the organisation, the step towards collaboration does not necessarily follow. Moreover, collaboratively developing and documenting the results of professional learning as proposed by previous research (Bereiter, 2002; Tillema, 2004; Vescio *et al.*, 2008) would not only consolidate results of exchange and development, but also materialise individual knowledge and TC, with that depriving individuals of a bit of their personal knowledge for the benefit of others. Given the value individuals attach to this personal knowledge and material, it has to be concluded that sharing and collaborative production do not always nor smoothly occur. The role materiality can play in practice and interpersonal behaviour, however, appears to be underestimated by those that are supposed to guide KM and create the foundations for practice in their organisation, such as HRM and HRD professionals. For management, this implies the need for a greater attention to the content and material that are involved in the professional context. It also emphasises why mere facilitation of knowledge sharing and interaction is insufficient and inadequate.

As, in the eyes of participants, knowledge, information and material are closely related, these sometimes are seen as possession or product, belonging to one or a few individuals. The finding that at times individuals withhold knowledge from colleagues reveals a remarkable context, which also touches the concept of *boundaries*. This study provides insight into how individuals categorise entities such as colleagues; how they constitute boundaries between entities such as themselves, types of colleagues and the management; and how they, by doing this and by influencing flows of information and other processes, impact the stability and dynamics of the social setting and daily practice.

Although there can be noted a shift, moving away from individuality in terms of the *context* for professional development (e.g. individual studies or coaching), *collectiveness* still is a debatable matter. Colleagues appear to be involved in reflection and discussion, making for mediation of practice and knowledge. Also, the development participants look for is practice-situated (be it that it mainly concerns their teaching). In such cases, the results match a trend towards a more collective reflection and exchange in the workplace that involves the individual in a social context, a trend that redefines development in a

way that avoids detaching the individual from social practices and goes beyond the individual (Elmholdt and Brinkman, 2006). Relating to the prevalent notion that attitudes and behaviours result from the social organisation of the workplace (Purkey and Smith, 1983; Rosenholtz, 1985, 1989), it has to be noted that "collective" does not equal a formal collective such as "the organisation" or "the team", but rather concerns a self-created collective. Harris and Muijs (2004) discuss both formal and informal professional dialogue for improvement and development of teachers. One can question the extent to which formal professional dialogue is beneficial, given the social settings and individual boundary setting and crossing – the informal arena appears to be more vivid and interactive than formal settings. This is also expressed in that what is shared. Knowledge and material of higher (personal) value is more often and quickly shared with "chosen ones": the type of colleague or the individuals that would be worth receiving something. In more formal settings, which are more likely to include entities from outside one's personal boundaries, individuals tend to limit exchange to the obvious, non-personal and general, such as practical and facilitative matters. This may provide an explanation to Plauborg (2009) who found that teachers tend to focus on practical actions and to use team collaboration as a way of extending their repertoire of actions. Formalised or organised professional development does not invite to share too much given the blurry boundaries and personal investment involved, yet such occasions can be very useful and safe to focus on general practice and to collect information and material from others.

The circumstances as described above create a distance between individuals and between the individual and other entities such as a team. Sociomaterial accounts tend to reject strict categories such as "individual–organisation" or "human–non-human" and to examine how the different boundaries separating assumed entities are stabilised and destabilised (Fenwick, 2012). Instead of focusing on one entity, key is to investigate the interrelatedness and dynamics of practice and context: professionalism does not limit itself to individual performance and use of material and environment, but extends itself to the interaction between entities. Interestingly, contesting such sociomaterial accounts, the current study shows how professionals themselves appear quite conscientious of separate entities, actively managing boundaries, interaction and their habitats.

The third key area concerns professional *commitment*. The current study provides clear examples of commitment to jobs and the profession, which is illustrated, for example, by long working days and proudness of the products produced. However, with (interpersonal) commitment referring to "the extent to which an actor engages in repeated exchanges with the same partner over time" (Cook *et al.*, 2013, p. 70) and considering individual autonomy to significantly influence exchange and the professional context, questions arise about professional commitment in the organisational context. This questionable professional commitment shows itself in the found reluctance to participate in knowledge exchange and interaction within the organisation, signalling decreasing commitment to the organisation. Additionally, as discussed, professionals ascribe such a value to materiality that material itself becomes a source of intentional behaviour. Moreover, this study found that professionals may use their autonomy to engage more often and profound with those colleagues who belong to their preferred social context.

An organisational focus on professionalism and KM draws away attention from the practice and topics teachers prioritise, which concerns their daily practice, intellectual and vocational development and their functioning as an educator (including pedagogy and techniques). It also shifts the *locus* of learning from practice as teachers see *their practice*, to systems, procedures and other structures that are seen as *organisational practice*. This

emphasises the boundaries between individual professionals and their surrounding entities, be it their colleagues in a team or the organisation. When individual professionals do not find what they look for in larger settings such as teams and "the organisation", they tend to focus on other entities and boundaries: their own performance and position in a small-scale, self-chosen social context. The facilitating atmosphere discussed by Ohlsson (2013), which would be of vital importance for collective reflection and exchange, is in this way created informally by individuals themselves. It is in this context consisting of trusted colleagues, that at times mirrors the "coalitions" Bienenstock and Bonacich (1992) describe, that individuals communicate and share through discussing cases, stories and products, as earlier shown by Krátká (2015) and Shank (2006). Such individuals may engage in repeated exchange with the same partner(s) over time, which, according to Cook *et al.* (2013), indicates commitment to specific colleagues, and indeed, the current study's results suggest that individual willingness to exchange is influenced by a satisfying, rewarding and fair relationship *between individual employees*. As such, commitment depends on interpersonal relationships and not only is related to interaction and exchange with the same partner(s) over time but also to the distribution of knowledge and power in a social network, underlining the idea that the social organisation of the workplace impact and form attitudes and behaviours (Purkey and Smith, 1983; Rosenholtz, 1985, 1989).

These developments picture a changing commitment, in which professionals' commitment revolves around their own practice and performance and around a specific and limited group of colleagues, rather than the organisation or formal entities and structures. There is personal commitment and there is professional commitment, but this professional commitment builds on the individual, their discretion and their choices regarding exchange, partners and duration of interaction, rather than on the social and organisational arrangements created or managed by others. While Zellermayer and Tabak (2006) describe the importance of mutuality between one's own work and that of colleagues for interpersonal understanding, reflecting and support, the current study suggests that such mutuality is Janus-faced. On the one hand, mutuality and shared practice indeed open up opportunities for interaction and understanding, much like the shared framework Homan (2001), Widmann and Mulder (2020) and others discuss. But at the same time, mutuality may elicit thoughts and feelings concerning competition, the personal nature of knowledge and attitudes regarding other entities in the organisation, with that emphasising boundaries and impacting (not seldom negatively) on decisions and behaviour.

In the network of agency of individuals, their (intercollegial) actions, materiality, knowledge and commitment are related to power because the engagement of individuals with other entities depends on their own choices. While organisations are focusing on professional learning from their own perspective trying to foster the development of competencies they deem adequate (that is, organisational professionalism), professional learning and collaboration in the practice of professionals are more situated in their environment, both in terms of knowledge and in terms of social structures. In that environment, they constitute commitment: they discuss and reflect, share or withhold insights and knowledge, and decide on frequency and content of exchange, partners to exchange with and the quality and duration of such intercollegial relationships.

Conclusions and implications
This study centralised the relationship between individual professionals and their personal knowledge on the one hand and the sharing of this knowledge in the organisation on the other, using the research question *How do individual professionals impact on knowledge sharing in practice?* Principally, it has to be noted that TC primarily

resides in individual professionals. Their considerations and intentions regarding sharing and interacting lay at the core of any knowledge-sharing activity. The answer to this question, then, can be twofold.

Although personal knowledge is difficult to share precisely, it can be shared quite adequately and contextually using reflection and stories in which metaphors and examples carry subtle personal knowledge. Such sharing can support others in their learning and practice: developing and applying new insights, ideas and techniques can help professionals changing their behaviour, such as communication, which can improve performance and practice. Therefore, the most straightforward answer would be: professionals can impact knowledge sharing and workplace learning by interactively and reflectively sharing and discussing stories, reflections, analyses and experiences with others.

However, as knowledge sharing assumes interpersonal communication, this means that considerations of one's agency, boundaries and relationships come into play. Especially when tacit or personal knowledge may become more explicit, or even materialised, knowledge becomes subject to considerations regarding one's position in their team or organisation. This dynamic provides insight into how agency is not only a matter of professionals and human behaviour but extends to the material world. With professionals reconsidering their boundaries and more consciously using their autonomy and discretion, knowledge sharing within social and organisational context is at danger of stagnating at the safer, first stage of sharing stories and examples, rather than moving on to the level of explicating, analysing and developing personal knowledge, not to mention converting it into artefacts and material to disseminate more broadly. Another answer to the research question, then, points at a more complicated issue. Individual professionals can impact knowledge sharing by managing personal and interpersonal boundaries, by consciously allocating their commitment, by choosing what to share, and with that, by influencing social settings for and the practices of knowledge sharing and workplace learning throughout their team, department and organisation.

This study highlights the gap between methods and concepts for knowledge sharing on the one hand and practice on the other. Individuals do not necessarily follow concepts, guidelines or instructions provided by, for example, management. Yet, the study provides insights that may contribute to decreasing this gap and that are of interest to management and HRD. It is crucial to consider informal social structures in and between organisational units (e.g. teams). Individual boundaries and relationships do not necessarily align with formal structures and channels setup in the organisation and as a consequence, knowledge flows may take unexpected or unwanted routes. When forming learning communities and other contexts for interaction, it is wise to incorporate both organisational goals and employees' personal aims to decrease chances of freewheeling and to scaffold learning opportunities by forming diverse groups that can work on a certain issue. Such an approach allows for some autonomy and agency for individuals, as they have influence on the boundaries in their social environment. Additionally, as products and learning outcomes in communities are shared, agency of material created becomes a shared matter too, which may tamper the development of protectionism and ineffective boundaries. Stimulating professional commitment, hence, is a matter of valuing one's personal knowledge and respecting their practice, and fostering interpersonal learning a matter of acknowledging one's efforts for that practice. Individual knowledge bases may symbiotically develop new insights, products and impact in the following ways: by acknowledging and valuing individual contributions;

aligning and interrelating individual and broader goals; and providing a fair degree of autonomy in composing and organising and learning communities and activities.

These insights may not only be beneficial for practice, but are also of importance to management (such as school leadership and HRD professionals) and policymakers. It is not far-reached to imagine that, if such dynamics play within teams and departments, they also impact interdepartmental and interorganisational contexts. With interdisciplinary approaches and cross-boundary collaboration being considered vital for prosperity, KM and innovation, one has to consider boundaries, agency and commitment of the participating entities, preferably involving those entities at the drawing table. This also calls for more research that focuses on individual ánd interpersonal factors such as autonomy, attitudes and agency in addition to organisational and facilitative matters. After all, collaborative learning and interpersonal sharing always involve setting foot in new territory, looking across borders and boundaries and distributing agency and involvement.

References

Admiraal, W., Schenke, W., De Jong, L., Emmelot, Y. and Sligte, H. (2021), "Schools as professional learning communities: what can schools do to support professional development of their teachers?", *Professional Development in Education*, Vol. 47 No. 4, pp. 684-698, doi: 10.1080/ 19415257.2019.1665573.

Antonacopoulou, E.P. (2008), "On the practise of practice: in-tensions and ex-tensions in the ongoing reconfiguration of practice", in Barry, D. and Hansen, H. (Eds), *The Sage Handbook of New Approaches in Management and Organization*, SAGE Publications, London, pp. 112-131.

Ball, S.J. (2009), "Privatising education, privatising education policy, privatising educational research: network governance and the 'competition state'", *Journal of Education Policy*, Vol. 24 No. 1, pp. 83-99, doi: 10.1080/02680930802419474.

Bereiter, C. (2002), *Education and Mind in the Knowledge Society*, Taylor and Francis, New York, NY, doi: 10.4324/9781410612182.

Bienenstock, E.J. and Bonacich, P. (1992), "The core as a solution to exclusionary networks", *Social Networks*, Vol. 14 Nos 3/4, pp. 231-243, doi: 10.1016/0378-8733(92)90003-P.

Blankenship, S. and Ruona, W. (2009), "Exploring knowledge sharing in social structures: potential contributions to an overall knowledge management strategy", *Advances in Developing Human Resources*, Vol. 11 No. 3, pp. 290-306, doi: 10.1177/1523422309338578.

Boeije, H. (2014), *Analyseren in Kwalitatief Onderzoek*, Denken En Doen, Boom Onderwijs, Amsterdam.

Brodkin, E. (2011), "Policy work: street-level organizations under new managerialism", *Journal of Public Administration Research and Theory*, Vol. 21 No. Supplement 2, pp. 444-450, doi: 10.1080/ 23303131.2016.1173503.

Cook, K.S., Cheshire, C., Rice, E.R.W. and Nakagawa, S. (2013), "Social exchange theory", DeLamater, J. and Ward, A. (Eds), *Handbook of Social Psychology*, Springer, Dordrecht, pp. 61-88, doi: 10.1007/ 978-94-007-6772-0_3.

Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A. and Sheikh, A. (2011), "The case study approach", *BMC Medical Research Methodology*, Vol. 11 No. 1, p. 100, doi: 10.1186/1471-2288-11-100.

Curtis, W., Murphy, M. and Shields, S. (2014), *Research and Education*, Routledge, London, doi: 10.4324/ 9781315858326.

Daniëls, E., Hondeghem, A. and Dochy, F. (2019), "A review on leadership and leadership development in educational settings", *Educational Research Review*, Vol. 27no, pp. 110-125, doi: 10.1016/j. edurev.2019.02.003.

Dudley, P. (2013), "Teacher learning in lesson study: what interaction-level discourse analysis revealed about how teachers utilised imagination, tacit knowledge of teaching and fresh evidence of pupils learning, to develop practice knowledge and so enhance their pupils' learning", *Teaching and Teacher Education*, Vol. 34, pp. 107-121, doi: 10.1016/j.tate.2013.04.006.

Edwards, R. and Holland, J. (2013), *What is Qualitative Interviewing?* Bloomsbury Academic, London.

Elliott, J.G., Stemler, S.E., Sternberg, R.J., Grigorenko, E.L. and Hoffman, N. (2011), "The socially skilled teacher and the development of tacit knowledge", *British Educational Research Journal*, Vol. 37 No. 1, pp. 83-103, doi: 10.1080/01411920903420016.

Elmholdt, C. and Brinkman, S. (2006), "Discursive practices at work: constituting the reflective learner", in Boud, D., Cressey, P. and Docherty, P. (Eds), *Productive Reflection at Work*, Routledge, London, pp. 170-180, doi: 10.4324/9780203001745.

Evetts, J. (2009), "New professionalism and new public management: changes, continuities and consequences", *Comparative Sociology*, Vol. 8 No. 2, pp. 247-266, doi: 10.1163/156913309X421655.

Fenwick, T. (2012), "Matterings of knowing and doing: sociomaterial approaches to understanding practice", in Hager, P., Lee, A. and Reich, A. (Eds), *Practice, Learning and Change. Professional and Practice-Based Learning*, Springer, Dordrecht, pp. 68-84, doi: 10.1007/978-94-007-4774-6.

Fenwick, T. and Nerland, M. (2014), "Introduction: sociomaterial professional knowing, work arrangements and responsibility: new times, new concepts?", in Fenwick, T. and Nerland, M. (Eds), *Reconceptualising Professional Learning: Sociomaterial Knowledges, Practices and Responsibilities*, Taylor and Francis, London, pp. 1-8, doi: 10.4324/9781315813714.

Garrick, J. and Chan, A. (2017), "Knowledge management and professional experience: the uneasy dynamics between tacit knowledge and performativity in organizations", *Journal of Knowledge Management*, Vol. 21 No. 4, pp. 872-884, doi: 10.1108/JKM-02-2017-0058.

Gherardi, S. (2009), "Knowing and learning in practice-based studies: an introduction", *The Learning Organization*, Vol. 16 No. 5, pp. 352-359, doi: 10.1108/09696470910974144.

Hager, P. (2012), "Theories of practice and their connections with learning: a continuum of more and less inclusive accounts", in Hager, P., Lee, A. and Reich, A. (Eds), *Practice, Learning and Change*, Professional and Practice-based Learning, Springer, Dordrecht, pp. 17-32, doi: 10.1007/978-94-007-4774-6.

Hager, P., Lee, A. and Reich, A. (2012), "Problematising practice, reconceptualising learning and imagining change", in Hager, P, Lee, A. and Reich, A. (Eds), *Practice, Learning and Change*, Professional and Practice-based Learning, Springer, Dordrecht, pp. 1-16, doi: 10.1007/978-94-007-4774-6.

Harris, A. (2008), "Distributed leadership: according to the evidence", *Journal of Educational Administration*, Vol. 46 No. 2, pp. 172-188, doi: 10.1108/09578230810863253.

Harris, A. and Muijs, D. (2004), *Improving Schools through Teacher Leadership*, Routledge, London.

Homan, T. (2001), *Teamleren. Theorie en Facilitatie*, Uitgeverij Academic Service, Schoonhoven.

Huber, M. (2016), "Neoliberal energies: crisis, governance and hegemony", in Springer, S., Birch, K. and MacLeavy, J. (Eds), *The Handbook of Neoliberalism*, Taylor and Francis, London, pp. 493-503, doi: 10.4324/9781315730660.

Huberman, M. (1993), "The model of the independent artisan in teachers' professional relations", in Little, J.W. and McLaughlin, M.W. (Eds), *Teachers' Work: Individuals, Colleagues and Contexts*, Teachers' College Press, New York, NY, pp. 11-50.

Köhne, M., Raimann, J. and Ulrich, C. (2006), "The influence of human networks and human value systems on knowledge sharing and/or transfer", in Back, A., Von Kroch, G., Seufert, A. and Enkel, E. (Eds), *Getting Real about Knowledge Networks*, Palgrave MacMillan, London, pp. 123-147.

Kothari, A.R., Bickford, J.K., Edwards, N., Dobbins, M.J. and Meyer, M. (2011), "Uncovering tacit knowledge: a pilot study to broaden the concept of knowledge in knowledge translation", *BMC Health Services Research*, Vol. 11 No. 1, pp. 198-208, doi: 10.1186/1472-6963-11-198.

Krátká, J. (2015), "Tacit knowledge in stories of expert teachers", *Procedia - Social and Behavioral Sciences*, Vol. 171, pp. 837-846, doi: 10.1016/j.sbspro.2015.01.199.

Levy, M. (2011), "Knowledge retention: minimizing organizational business loss", *Journal of Knowledge Management*, Vol. 15 No. 4, pp. 582-600, doi: 10.1108/13673271111151974.

Livingstone, D.W. and Guile, D. (Eds) (2012), "The knowledge economy and education", *The Knowledge Economy and Lifelong Learning. A Critical Reader*, Vol. 4, Sense Publishers, Rotterdam, doi: 10.1007/978-94-6091-915-2.

Magrath, B., Aslam, M. and Johnson, D. (2019), "Systems research in education: designs methods", *Research in Comparative and International Education*, Vol. 14 No. 1, pp. 7-29, doi: 10.1177/1745499919828927.

Manidis, M. and Scheeres, H. (2012), "Towards understanding workplace learning through theorising practice: at work in hospital emergency departments", in Hager, P, Lee, A. and Reich, A. (Eds), *Practice, Learning and Change*, Professional and Practice-based Learning, Springer, Dordrecht, pp. 103-118, doi: 10.1007/978-94- 007-4774-6.

Mathieu, J.E., Heffner, T.S., Goodwin, G.F., Salas, E. and Cannon-Bowers, J.A. (2000), "The influence of shared mental models on team process and performance", *Journal of Applied Psychology*, Vol. 2 No. 2, pp. 273-283, doi: 10.1037/0021-9010.85.2.273.

McCotter, S.S. (2001), "Collaborative groups as professional development", *Teaching and Teacher Education*, Vol. 17 No. 6, pp. 685-704.

Nonaka, I. and Takeuchi, H. (1995), *The Knowledge-Creating Company. How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, Oxford.

Ohlsson, J. (2013), "Team learning: collective reflection processes in teacher teams", *Journal of Workplace Learning*, Vol. 25 No. 5, pp. 296-309, doi: 10.1108/JWL-Feb-2012-0011.

Ottesen, E. and Møller, J. (2016), "Organisational routines – the interplay of legal standards and professional discretion", *European Educational Research Journal*, Vol. 15 No. 4, pp. 428-446, doi: 10.1177/1474904116638853.

Patrick, F., Forde, C. and McPhee, A. (2003), "Challenging the 'new professionalism': from managerialism to pedagogy?", *Journal of in-Service Education*, Vol. 29 No. 2, pp. 237-254, doi: 10.1080/13674580300200214.

Plauborg, H. (2009), "Opportunities and limitations for learning within teachers' collaboration in teams: perspectives from action learning", *Action Learning: Research and Practice*, Vol. 6 No. 1, pp. 25-34, doi: 10.1080/14767330902731293.

Polanyi, M. (1958), *Personal Knowledge. Towards a Post-Critical Philosophy*, Routledge and Kegan Paul, London.

Polanyi, M. (1969), "Knowing and being", in Grene, M. (Ed.), *Knowing and Being: Essays by Michael Polanyi*, University of Chicago Press, Chicago, IL, pp. 123-207.

Ponnert, L. and Svensson, K. (2016), "Standardisation - the end of professional discretion?", *European Journal of Social Work*, Vol. 19 Nos 3/4, pp. 586-599, doi: 10.1080/13691457.2015.1074551.

Powell, W.W. and Snellman, K. (2004), "The knowledge economy", *Annual Review of Sociology*, Vol. 30 No. 1, pp. 199-220, doi: 10.1146/annurev.soc.29.010202.100037.

Purkey, S.C. and Smith, M.S. (1983), "Effective schools: a review", *The Elementary School Journal*, Vol. 83 No. 4, pp. 427-452, available at: www.jstor.org/stable/1001168

Reich, A. and Hager, P. (2014), "Problematising practice, learning and change: practice-theory perspectives on professional learning", *Journal of Workplace Learning*, Vol. 26 Nos 6/7, pp. 418-431, doi: 10.1108/JWL-02-2014-0016.

Rosenholtz, S.J. (1985), "Effective schools: interpreting the evidence", *American Journal of Education*, Vol. 93 No. 3, pp. 352-388, doi: 10.1086/443805.

Rosenholtz, S.J. (1989), *Teachers' Workplace: The Social Organization of Schools*, Longman, New York, NY.

Saldaña, J. (2014), "Coding and analysis strategies", in Leavy, P. (Ed.), *The Oxford Handbook of Qualitative Research*, Oxford University Press, Oxford, pp. 581-605.

Schaik, P.V., Volman, M., Admiraal, W.W. and Schenke, W. (2019), "Approaches to co-construction of knowledge in teacher learning groups", *Teaching and Teacher Education*, Vol. 84, pp. 30-43, doi: 10.1016/j.tate.2019.04.019.

Schatzki, T.R. (2001), "Introduction: Practice theory", in Knorr, C.K., Schatzki, T.R. and von Savigny, E. (Eds), *The Practice Turn in Contemporary Theory*, Routledge, London, pp. 10-23, doi: 10.4324/9780203977453.

Senge, P.M. (1990), *The Fifth Discipline: The Art and Practice of the Learning Organization*, Doubleday/Currency, New York, NY.

Senge, P.M., Camron-McCabe, N., Dutton, J., Kleiner, A., Lucas, T. and Smith, B. (2000), *Schools That Learn: A Fifth Discipline Fieldbook for Educators, Parents and Everyone Who Cares about Education*, Currency/Doubleday, New York, NY.

Shank, M.J. (2006), "Teacher storytelling: a means for creating and learning within a collaborative space", *Teaching and Teacher Education*, Vol. 22 No. 6, pp. 711-721, doi: 10.1016/j.tate.2006.03.002.

Shim, H.S. and Roth, G.L. (2007), "Sharing tacit knowledge among expert teaching professors and mentees: considerations for career and technical education teacher educators", *Journal of STEM Teacher Education*, Vol. 44 No. 4, pp. 5-28.

Spillane, J.P. (2012), *Distributed Leadership*, John Wiley and Sons, Hoboken, NJ.

Stoll, L. and Louis, K.S. (Eds) (2007), *Professional Learning Communities. Divergence, Depth and Dilemmas*, Open University Press, Maidenhead.

Stoll, L., Bolam, R., McMahon, A., Wallace, M. and Thomas, S. (2006), "Professional learning communities: a review of the literature", *Journal of Educational Change*, Vol. 7 No. 4, pp. 221-258, doi: 10.1007/s10833-006-0001-8.

Stout, R.J., Cannon-Bowers, J.A., Salas, E. and Milanovich, D.M. (1999), "Planning, shared mental models, and coordinated performance: an empirical link is established", *Human Factors: The Journal of the Human Factors and Ergonomics Society*, Vol. 41 No. 1, pp. 61-71, doi: 10.1518/001872099779577273.

Tillema, H.H. (2004), "Gericht werken met competenties in de opleiding", *VELON Tijdschrift Voor Lerarenopleiders*, Vol. 25 No. 2, pp. 28-34.

Toole, J.C. and Louis, K.S. (2002), "The role of professional learning communities in international education", in Leithwood, K.A. and Hallinger, P. (Eds), *Second International Handbook of Educational Leadership and Administration*, Springer, Dordrecht, pp. 245-275, doi: 10.1007/978-94-010-0375-9_10.

Torff, B. (1999), "Tacit knowledge in teaching: folk pedagogy and teacher education", in Sternberg, R.J. and Horvath, J.A. (Eds), *Tacit Knowledge in Professional Practice: Researcher and Practitioner Perspectives*, Lawrence Erlbaum Associates Publishers, Mahwah, pp. 195-213.

Van den Bossche, P., Gijselaers, W.H., Segers, M. and Kirschner, P.A. (2006), "Social and cognitive factors driving teamwork in collaborative learning environments team learning beliefs and behaviors", *Small Group Research*, Vol. 37 No. 5, pp. 490-521, doi: 10.1177/1046496406292938.

Verloop, N. and Kessels, J.W.M. (2006), "Opleidingskunde: ontwikkelingen rond het opleiden en leren van professionals in onderwijs en bedrijfsleven", *Pedagogische Studiën*, Vol. 83 No. 4, pp. 301-321, available at: www.pedagogischestudien.nl/download?type=document&identifier=616429

Vescio, V., Ross, D. and Adams, A. (2008), "A review of research on the impact of professional learning communities on teaching practice and student learning", *Teaching and Teacher Education*, Vol. 24 No. 1, pp. 80-91, doi: 10.1016/j.tate.2007.01.004.

Wenger, E., McDermott, R. and Snyder, W. (2002), *Cultivating Communities of Practice*, Harvard Business School Press, Cambridge, MA.

Widmann, A. and Mulder, R.H. (2020), "The effect of team learning behaviours and team mental models on teacher team performance", *Instructional Science*, Vol. 48 No. 1, pp. 1-21, doi: 10.1007/s11251-019-09500-6.

Zellermayer, M. and Tabak, E. (2006), "Knowledge construction in a teachers' community of enquiry: a possible road map", *Teachers and Teaching*, Vol. 12 No. 1, pp. 33-49, doi: 10.1080/13450600500364562.

About the author
Maarten Matheus van Houten was trained as an interdisciplinary social scientist and obtained Master's degrees in professional learning and teaching, before completing his research doctorate, in which he focused on vocational education and the sharing of professional (tacit) knowledge. He has worked in secondary vocational education and higher education as a teacher/lecturer, coordinator and educationist. His research interests concern knowledge sharing, learning from and collaboration between colleagues and contexts of social interaction for learning, such as communities and learning organisations. Maarten Matheus van Houten can be contacted at: maarten.vanhouten@gmail.com