



# Tapping into the mental resources of teachers' working knowledge: Insights into the generative power of intuitive pedagogy

Lina Markauskaite\*, Peter Goodyear<sup>1</sup>

Centre for Research on Computer Supported Learning and Cognition (CoCo), Faculty of Education & Social Work (A35), The University of Sydney, Sydney, NSW 2006, Australia

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## ABSTRACT

This paper provides novel insights into the kinds of mental resources on which teachers draw in their pedagogical sense-making (about everyday teaching decisions), and into the origins of these mental resources. The paper examines how teachers' knowledge is grounded in diverse social, cognitive and metacognitive experiences of learning and teaching phenomena. It contributes to the development of new ways of theorising the links between (a) experiential knowledge resources, which originate in specific activities and interactions, and (b) an integrated conceptual understanding that organises professional sense-making across diverse situations and contexts. By combining conceptual ideas about knowledge fragmentation with original empirical observations from a study of the form and functioning of teachers' working knowledge in higher education, the paper advances two lines of theoretical argument. Firstly, teachers' working knowledge is better seen as contextualised and fragmented rather than as a systematic personal theory. There are advantages to pedagogical 'knowledge-in-pieces' that can be activated and combined in different ways in interaction with various contexts. Secondly, pedagogical ideas and ways of knowing that originate in one's personal experience ('intuitive pedagogy') can be a productive resource in teacher thinking, action and professional learning. The paper suggests that the view of professional learning in, and through, practice should be expanded from its traditional focus on social and material interactions to also include the consideration of simultaneous interactions with one's mind.

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## 1. Introduction

### 1.1. Background: teachers' working knowledge

Research on teachers' knowledge and expertise broadly agrees about the complexity of teacher knowledge and knowing (e.g. Bromme, 1994; Calderhead, 1996; Minstrell, 1999; Shulman, 1986, 2004; Winch, 2004). It includes not only propositional knowledge, facts and formal concepts, but also skills, hunches and beliefs. This paper focuses on what Yinger and Lee called 'working knowledge' in teaching: the kind of knowledge that is "particularly useful to get things accomplished in practical situations" (Yinger & Hendricks-Lee, 1993, p. 100). Other terms have been used for similar kinds of knowledge and knowing, such as 'knowing in action' (Schön, 1995), 'actionable knowledge' (Argyris, 1999), 'action-oriented understanding', 'personal practical knowledge'

\* Corresponding author at: Centre for Research on Computer Supported Learning and Cognition (CoCo), Faculty of Education and Social Work (A35), The University of Sydney, NSW 2006, Australia. Tel.: +61 2 9036 5320, fax: +61 2 9036 5205.

E-mail addresses: [Lina.Markauskaite@sydney.edu.au](mailto:Lina.Markauskaite@sydney.edu.au) (L. Markauskaite), [Peter.Goodyear@sydney.edu.au](mailto:Peter.Goodyear@sydney.edu.au) (P. Goodyear).

<sup>1</sup> Tel.: +61 2 9351 4708; fax: +61 2 9036 5205.

(Clandinin, 1985), 'metis' (Baumard, 1999) and 'sense-making' (Weick, 1995). This knowledge includes various kinds of thinking and understanding, including conceptual or structural knowledge ('What'), procedural knowledge ('How'), strategic knowledge ('Why') and contextual knowledge ('When') (Atkinson & Claxton, 2000; Jonassen, 2003; Shavelson, Ruiz-Primo, & Wiley, 2005). However, working knowledge is distinct from the formal concepts, strategies or rules of reasoning that are often held to constitute professional knowledge bases. Working knowledge involves diverse knowledge resources that are used *functionally* to organise one's understanding, make plausible sense of encountered situations and act sensibly (cf. Greeno, 2012).

A professional's 'working knowledge' involves explicit and implicit components (Collins, 2010; Eraut, 2000, 2007; Perry, 1965; Sternberg & Horvath, 1999). *Explicit knowledge* is knowledge that a person can articulate with relative ease. It often refers to more systematic types of knowledge – including normative and empirical – that can be characterised by a unified conceptual basis and logical connections between parts (Winch, 2004). Such accessible and integrated knowledge is seen as a key ingredient of expertise in most accounts of teacher professional practice, whether rationalistic, reflective or critical (Furlong, 2000). *Implicit knowledge* is less readily available to consciousness and is harder to put into words. Such knowledge is often grounded in experience and useful for practical decisions. However, it can rarely be represented in an articulated, systematic fashion or justified without referring to one's 'commonsense' (Atkinson & Claxton, 2000; Collins, 2010; Perry, 1965).

Implicit knowledge can arise in several ways. For example, repetition and practice in professional work can lead to some mental processes becoming automatic – not requiring conscious attention. In some cases, this knowledge originates in explicitly learnt principles which experts can articulate when requested. In other cases, it is deeply tacit and not readily available for introspection (cf. Collins, 2010; Ohlsson, 2011). The ability to use implicit knowledge in fluent expert performance is highly valued in complex individual and collective professional work, including teaching (Atkinson & Claxton, 2000; DiBello, Missildine, & Struttman, 2008; Sternberg & Horvath, 1999; Torff & Sternberg, 2001).

In contrast, some other kinds of implicit knowledge, such as the knowledge that arises from everyday experience, is not so highly valued and is often referred to as a 'folk' or 'naïve' way of understanding. Examples include the 'naïve conceptions' (or 'alternative conceptions' or even 'misconceptions') identified by researchers in science education (e.g. Driver, 1989; Vosniadou, 2002). Similar kinds of 'commonsense', 'folk' or 'naïve' ways of understanding learning and pedagogy – acquired through everyday experiences – are typically also considered as primitive, inconsistent and counterproductive in the development of teacher expertise (e.g. Torff, 1999). Just as the 'everyday conceptions' of scientific phenomena, acquired through direct engagement with the physical world, are sometimes held to interfere with the adoption of scientifically accepted ways of understanding those phenomena, so, it is argued, everyday personal experiences of learning, teaching and other social and cognitive phenomena create a 'folk pedagogy,' and 'folk psychology' (Olson & Bruner, 1996), which is held to interfere with the adoption of more systematic, evidence-based, theoretically coherent ways of understanding teaching and learning phenomena, and therefore should be confronted and replaced with 'expert like' pedagogical understanding (e.g. see Ho, 2000; Ryan & Healy, 2008; Torff, 1999).

Sharp oppositions between tacit and explicit, commonsense and specialised, functional and formal, fragmented and coherent types of knowledge have been contested in both professional practice and education. It is proposed that some kinds of intuitive knowledge cannot be replaced by explicit or specialised knowledge (Collins, 2010; Greeno, 2012; Gupta, Hammer, & Redish, 2010; Perry, 1965; Polanyi, 1966/2009). For example, Perry (1965) argued that different kinds of knowledge often draw on each other, and while "(1) commonsense is not sufficient for problems that require specialised treatment, (2) it is needed in addition to specialised knowledge to make complete sense of the specialised treatment by relating it to general experience" (p. 126–127). Perry identified several distinct functions of commonsense knowledge. First, commonsense provides a body of knowledge which is not set before people in specialised technical discussions, but is needed to make these conversations intelligible. Second, while specialised knowledge facilitates deep investigations, commonsense helps to establish the relevance of different kinds of specialised knowledge to practical situations. Third, Perry suggests that there is a close interaction between the development of specialised knowledge and experiential, commonsense understanding. Different types of specialised knowledge arise from experience and, when specialised knowledge is available, commonsense draws on ideas from specialised knowledge to make experience intelligible.

Further, a number of studies have questioned whether experts always draw on one coherent, formally articulated conceptual base in their practical decisions. For example, Chi and Ohlsson (2005) noted that knowledgeable people often operate with inconsistency and that this might indicate an intellectual flexibility rather than a lack of expertise. Similarly, Gupta et al. (2010) have depicted physicists flexibly and productively drawing upon, and switching between, scientifically correct and 'naïve' ontological categories in their reasoning about complex scientific phenomena. They argue that multiple ways of thinking, which are sensitive to the context, are an important part of expert epistemology. Similarly, studies of concept formation in professional activities provide increasing evidence that manifold ways of meaning making, and fluent use of "formal" and "everyday" concepts, are key enablers of shared meaning making, learning and conceptual change (e.g. see Engeström & Sannino, 2012; Greeno, 2012).

In the current intellectual climate of evidence-based practice and reflective thought, explicit, articulated forms of knowledge, and deliberative, conscious, thinking and reflection tend to be the main focus of teacher development programmes and research. In contrast, less internally consistent and less well articulated forms of knowledge and learning tend to be under-theorised and undervalued (Atkinson & Claxton, 2000; Eraut, 2000).

Further, as Billett (2006) points out, some accounts of professional learning tend to privilege the role of social aspects, such as those provided by communities of practice and activity systems in specific situations. In so doing they downplay the role of individual aspects, such as the contributions of one's earlier experiences, intentionality and subjectivity, all of which guide cognition and learning throughout a working life. As Billett points out, the concept of learning and development over a life span

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