

Unveiling professional development: A critical review of stage models

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Abstract

Traditionally, in research across professions, development of professional skill was seen as accumulation of knowledge and skills, promoted by practical experience. More recently, this view has been modified to incorporate skilful know-how that is progressively acquired by passing through developmental stages, such as novice, competent and expert. We critically review contemporary stage models that typically apply across professions. Our principal critique is that a focus on stages veils or conceals more fundamental aspects of professional skill development. Based on our critique, we propose an alternative model that builds upon strengths of previous models, while seeking to overcome their major limitations. Finally, we outline implications of our model for professional education, workplace practices, and research on professional development.

Keywords: professional development, professional skill, stage model, development model

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The emergence of a new knowledge-based economy has placed increasing emphasis on the development of professional skill. Professional skill is used broadly in this article to refer to the skilfulness with which professionals engage in practice. Rapid technological advances in areas such as biotechnology, microelectronics, computers and the internet (Castells, 1996), more knowledge- and service-based industry (Neef, 1998), the emergence of so-called knowledge intensive firms (Alvesson, 1993, 2004; Starbuck, 1992), increased professionalization (Albert & Bradley, 1997), and globalization of the economy (Gilpin, 2000) demand ongoing skill development of the workforce (Sandberg, 2000; Sandberg & Pinnington, in preparation).

Taken together, socio-economic changes have led to new and pressing demands on educational institutions and other organizations to become more efficient in promoting skill development across the professions. A central question, then, is what is entailed in professional skill development. This question is fundamental because it underlies professional development programs, both formal and informal, including those provided by educational institutions and those occurring in the workplace. It also underlies a range of managerial activities including appraisals, career progression, and pay systems that encourage particular skill development. Furthermore, the approach taken to the question of what is entailed in professional skill development forms the basis for how we design and conduct research on such development.

Delimiting Professional Development

The term professional development is currently not clearly delimited. A profession has traditionally been defined as having a systematic, scientific knowledge base. Preliminary development of professional skill has largely occurred through designated higher education programs, with subsequent development taking various forms. For the purposes of this article, we have chosen to delimit professional development as formal courses and programs within professional education, as well as the informal and formal development of professional skill that

occurs within the workplace. Formal professional education courses and programs may be directed either towards those who are inexperienced and seeking to gain entry to a particular profession, or experienced professionals who participate in some form of continuing education outside their usual place of work. Professional development within the workplace might be organised in the form of structured activities or courses with the purpose of enhancing professional skill, keeping a group of professionals up-to-date, or supporting change within an organisation. When professional development occurs informally, it is typically a part of the day-to-day work of the professionals concerned – a kind of learning-on-the-job. Various models have been proposed to account for professional development that occurs in the forms outlined above.

According to dominant models (e.g., Ericsson & Smith, 1991; Hoffman, 1992; Sternberg, & Ben-Zeev, 2001; Sternberg, et al., 2000), skill development takes place in a step-wise, cumulative way. In these models, becoming a skilled professional involves progressively accumulating a set of knowledge and skills, principally acquired and developed through practical experience in the workplace. In this article, we critically review contemporary stage models to challenge the notion that skill development takes the form of step-wise progression. In particular, we argue that the current assumption of skill development as step-wise progression has veiled or concealed more fundamental aspects. Drawing upon recent empirical research, we describe and illustrate these veiled aspects. We then propose an alternative model of professional development that builds upon the strengths of previous models, while seeking to overcome their main limitations. Finally, we outline some implications of our alternative model for professional education, workplace practices, and research on professional development.

Skill in Professional Practice

As a background to critically reviewing contemporary models of professional skill development, it is necessary to consider the notion of professional practice itself. As Jean Lave (1993) has pointed out, in contemporary theories about professional skill and its development, practice is generally seen as a 'container' for particular forms of social interaction, such as that occurring in teaching or management. More specifically, the container that constitutes practice is often seen as an objective structure consisting of institutionalized social rules and norms. Moreover, as Raymond McDermott (1993) argued, when seen as a container, practice and content are regarded as two independent entities. Hence, it is possible to decontextualize content from practice and to study the two independently. This decontextualized content, or professional skill, is then formalized and taught in professional education. It is assumed that educated professionals will later enter the appropriate 'practice container' and be able to perform within it.

During recent decades, the 'container' view of practice has been questioned within social science (Blackler, 1993, 1995; Billett, 2001; Bourdieu, 1977; Chaiklin & Lave, 1993; Gergen, 1985; Gherardi, 2000; Giddens, 1984, 1993; Greenwood & Hinings, 1996; Putnam & Borko, 2000). The main criticism is that professionals cannot meaningfully be separated in this manner from their activities and the situations in which they practise. Anthony Giddens (1984) argued that practice is neither constituted by an objective structure constraining professionals' action, nor solely by the professionals' subjectivity, as sometimes claimed. Rather, practice is intersubjectively constituted through mutual understanding of a specific institutionalised order enacted by professionals. This means that practice is not a fixed or static container but, rather, a dynamic flow produced and reproduced by professionals.

Given this view of practice, at any one point in time there are not one but many different practices. As empirical research demonstrates (Billett, 2001; Borko et al., 1997; Mol, 2002), one and the same practice varies considerably across contexts, as does what is regarded as skilful performance in each context. Not only is there variation in ways of enacting practice, but some of these may conflict with one another. For example, conceiving teaching primarily as knowledge transfer from teacher to learner is inconsistent with placing emphasis on facilitating change in understanding (Borko et al., 1997). Similarly, in medicine a preoccupation with diagnosing and treating dysfunctional parts of the physical body is at odds with taking a holistic view of the patient and the impact of illness on his/her life (Dall'Alba, 2002, 2004).

The issues raised here in relation to practice including its intersubjective, dynamic nature and its pluralistic character provide a stark contrast to the views of practice underlying traditional models of professional skill development. Below we outline some of these contemporary models as we begin to critically examine what is entailed in professional skill development.

Contemporary Models of Professional Skill Development

Most contemporary models of skill development have been devised within cognitive psychology. Over the past three decades, cognitive psychology has produced a range of models of how people develop expert skill in professions such as teaching, music, law and management. Overviews of these models are presented elsewhere (e.g., Berliner, 1994; Billett, 2001; Ericsson & Smith, 1991; Hoffman, 1992; Sternberg, & Ben-Zeev, 2001; Sternberg, et al., 2000). While these models vary with respect to both the number of stages that must be passed through and the nature of each stage, they have in common a fixed sequence of stages representing successively higher levels of knowledge and skills acquisition. For instance, some empirical studies distinguish novice and expert stages in terms of extent and complexity of knowledge structures

(e.g., Berliner, 1994; Carter et al., 1988; Chi, Feltovich, & Glaser, 1981; Livingston & Borko, 1989). Sharon Feiman-Nemser and Janine Remillard (1996) note that stage models of teacher development tend to put forward “an initial stage of survival and discovery, a second stage of experimentation and consolidation, and a third stage of mastery and stabilisation” (p. 66).

These stage models are based on a traditional notion of professional skill as a set of attributes, such as knowledge, skills and attitudes. The attributes are usually identified and described in a decontextualized manner, separate from the practice to which they refer, in line with a container view of practice. For example, competence in leadership is typically identified and described in the form of attributes possessed by successful leaders (Yukl, 1994; Sandberg, 2001). Similarly, a body of knowledge and skills has been identified for professions such as teaching, medicine, engineering, architecture, policing, and social work (Friedson, 2001).

Accordingly, when developing professional skill, the point of departure is usually a formalised body of knowledge and skills, often described in textbooks. For example, in formal professional education, the curriculum typically emphasises the progressive accumulation of a body of knowledge and skills (Dall’Alba & Barnacle, 2005; Dall’Alba & Sandberg, 1996). Aspiring professionals are initially expected to acquire basic knowledge and skills relevant to the profession and, later, more advanced knowledge and skills. Subsequently in the workplace, formal and informal training programs are generally designed to promote further accumulation of knowledge and skills.

Skill development at work is accompanied by a range of management activities, such as appraisals, career progression, and pay systems, which prescribe and encourage accumulation of a desirable set of knowledge and skills. For instance, if a professional has acquired certain knowledge and skills as stipulated by the organization, she or he may be promoted and rewarded with higher salary or other benefits.

The notion that skill development can be conceptualised as an accumulation of a defined body of knowledge and skills has been questioned extensively from within a range of research approaches (e.g., Ball & Cohen, 1999; Benner, 1984; Billett, 2001; Borko & Putnam, 1996; Dall’Alba, 2002, 2004, in preparation; Dreyfus & Dreyfus, 1986; Dreyfus, 2002; Dall’Alba & Barnacle, 2005; Dall’Alba & Sandberg, 1996; Fielding, 1988a; Hargreaves & Fullan, 1992; Hunt, 1987; Lave, 1993; Little, 1993; McDermott, 1993; Robertson, 1992; Sandberg, 1994, 2000, 2001; Sandberg & Pinnington, in preparation; Schön, 1983, 1987; Tsoukas, 1996; Tsoukas & Vladimirou, 2001; Winograd & Flores, 1986). Models based upon such a conceptualisation have been challenged and extended in one of the most advanced and influential models of skill acquisition proposed by Hubert and Stuart Dreyfus (1986; Dreyfus, 2002). This influential model has been used in empirical studies in a range of professional contexts, such as nursing (Benner, 1984; Benner, Tanner, & Chesla, 1996), teaching (Berliner, 1994), management (Worthy, 1996), social work (Ryan, Fook, & Hawkins, 1995), and computer programming (Campbell, Brown & DiBello, 1992; Chmiel & Loui, 2004).¹

Search and Selection Procedures

We searched for, and closely investigated, empirical studies in which the Dreyfus model has been used. We used search terms including skill acquisition, knowledge acquisition, professional development, competence development, development of expertise, stage model, novice to expert, and novice and expert, using ERIC, Infotrac, ABI/INFORUM, SCI-Expanded, Social Science Citation Index, and Arts & Humanities Citation Index databases. We then used Google Scholar to locate works referring to Dreyfus and Dreyfus (1986) in which their stage model is used. All the empirical studies we located through these searches are reviewed here and had in common the features we critique in this review.

Below we use the Dreyfus model as an example of stage models of professional development, examining it in the context of recent empirical research about the development of professional skill. While we examine the assumptions and arguments associated with the Dreyfus model, we note below that many of the points we make also apply to other stage models.

Dreyfus and Dreyfus Stage Model: From Rules to Skilful Know-how

Dreyfus and Dreyfus (1986) developed their model as a critique of the prevalent view of human skill development within artificial intelligence, which involves an accumulation of explicit rules to follow in order to perform a specific task. Dreyfus and Dreyfus challenged this view in a fundamental way. According to them, explicit rule following takes place at basic, not more advanced, skill levels. Instead, more advanced skill levels are characterized by experience-based know-how that cannot be articulated entirely in the form of rules. More specifically, based on their study of skill acquisition among airline pilots, chess players, automobile drivers, and adult learners of a second language, they argued that skill acquisition in each new area typically proceeds through five skill levels. These skill levels are: novice, advanced beginner, competent, proficient and expert. However, not all achieve expert status.

Novice. According to Dreyfus and Dreyfus, novices usually follow explicit rules they have been instructed to apply when recognising certain objective facts and features of a situation in their skill domain. For instance, novice automobile drivers are instructed to change gear at a certain speed, which they tend to do independently of context.

Advanced beginner. Advanced beginners can be distinguished from novices in that they not only apply explicit but also context-specific rules when approaching a situation. They have acquired these context related rules through practical experience not formal instruction. For example, when driving a car, advanced beginners not only follow a rule about changing gear at

a certain speed but also use situational cues, such as engine sound, to decide when to change gear.

Competent. The main characteristic of competent professionals is that they choose a plan, goals, and strategies for when and how to apply rules and procedures. For instance, car drivers wanting to drive to work as quickly as possible may choose the shortest possible way with as little traffic as possible. They may even decide to violate the speed limit and reduce an accepted distance between cars in order to achieve their plan.

Proficient. Novices, advanced beginners, and competent professionals approach each new situation in a detached and deliberate way. In contrast, proficient professionals intuitively assess each new situation against the background of previous experience.

Expert. Expert skill is based on deep situational experience acquired through involvement in a specific skill domain for extended periods of time. Those who have reached this stage do not rely upon explicit rules; the novice's rule-following has been transformed to skilful know-how. Experts are 'as one' with their work. Expert pilots experience themselves as flying rather than flying an aircraft. Experts intuitively and holistically identify problems, goals, plans, and actions. They simultaneously see a whole problem situation and the way to solve it: "When things are proceeding normally, experts don't solve problems and don't make decisions; they do what normally works" (Dreyfus & Dreyfus, 1986, pp. 30-31).

The Dreyfus model of skill acquisition extends previous models in a number of ways. First, professional skill is not primarily context-free but context-dependent. With progression through the stages of skill acquisition, the situational character of professional skill becomes more evident. Second, only those at lower skill levels, such as novices and advanced beginners, routinely approach each situation in a detached and deliberative way. More advanced professionals, such as those who have achieved proficient and expert levels, approach each new

situation intuitively. Only when things do not work as they normally would is their intuitive involvement in practice temporarily interrupted. Third, more advanced skill levels can only be achieved through experience of practical work situations. These advanced skill levels cannot be achieved by acquiring context-free knowledge and skills, as assumed within previous models of skill acquisition.

A Critique of Stage Models of Development

Although the Dreyfus model advances our understanding of skill development when compared with previous models, it incorporates some significant limitations of such models. This model, along with previous ones, lacks clarity about *what* is being developed.² In other words, what constitutes skill in teaching, aeroplane piloting, engineering, and so on? What characterises and distinguishes skilful performance in each area of skill? Stage models of development appear to assume we know what skilful performance entails for each area of skill.

It is important to distinguish here between being able to recognise skilful performance and understanding what is involved in its achievement. When members of a team of experienced engineers were each independently asked who among them were most skilful, they identified the same few individuals (Sandberg, 1994, 2000). When requested to explain in what way these individuals were most skilful, they each described them as having more of the specific skills they themselves had, although they varied in the skills they used. In other words, while they identified the same individuals as most skilful, there was lack of agreement about what this skilfulness involved.

In substantial empirical studies using the Dreyfus model, Patricia Benner and her colleagues (Benner, 1984; Benner, Tanner, & Chesla, 1996) provide some clarity on the question of what skilful nursing involves. They demonstrate a complex interplay of several domains of knowledge within skilled nursing practice. In addition, they outline the way in

which emotion is necessarily integrated into skilled professional judgement, rather than being an impediment to such judgement, as traditionally claimed. Although they provide rich narrative accounts of nursing for each stage of the Dreyfus model, the significant contribution of their work lies not in its treatment of stages but in the insights it provides about the nature of nursing practice per se and, thereby, of professional practice. In our view, these insights are largely achieved despite, rather than through, the use of the Dreyfus stage model.

Our principal critique of the Dreyfus model³ and other stage models is that a focus on stages veils more fundamental aspects of development. A focus on stages has directed attention away from the skill that is being developed. We argue below that a fundamental dimension of professional skill development, namely, *understanding of, and in, practice*, is overlooked in stage models. In particular, we argue that understanding of, and in, practice forms the basis for professional skill and its development. Understanding is not seen here as limited to cognitive content or activity; rather it is embodied in the sense of Maurice Merleau-Ponty's (1962/1945) 'lived body' and John Dewey's (1958/1934) 'habit'. Accordingly, understanding is embedded within dynamic, inter-subjective practice. Our notion of understanding integrates knowing, acting, and being. Understanding of practice, then, is enacted in and through practice. Such embodied understanding of professional practice constitutes an unfolding 'professional way-of-being' (Dall'Alba, 2004, in preparation). In other words, professionals not only learn knowledge and skills, but these are renewed over time while becoming integrated within ways of being the professional in question.

For example, Hilda Borko and her colleagues (Borko et al., 1997, 2000) provide empirical evidence of how school teachers' understanding of teaching is enacted in and through the learning activities and assessment they provide for their students, although these researchers do not theorise the interrelationships in this way. The usefulness of using such theorisation to

explore these interrelationships has been demonstrated in relation to teaching in the higher education context (Dall'Alba, 2005).

Our embodied notion of understanding can be distinguished from an emphasis on knowledge and beliefs in the cognitive psychology literature on professional development during the past decade (e.g., Borko & Putnam, 1996; Borko et al., 1997; Borko et al., 2000; Feiman-Nemser & Remillard, 1996). These knowledge and beliefs are seen as 'filters in the mind' for each situation that is encountered and for learning from those situations. For instance, in the example from school teachers provided above, Borko and her colleagues argue that "beliefs serve as filters through which new ideas are perceived and interpreted" (1997, p. 270). However, this begs the question of how the gap between contents of the mind and professional practice is bridged. Our own notion of understanding as embodied and embedded in inter-subjective practice avoids such mind-practice dualism. Much of the research conducted by advocates of practice-based approaches, including communities of practice and situated learning (Ball & Cohen, 1999; Lave and Wenger, 1991; Wenger, 1998; Putnam & Borko, 2000), activity theory (Engeström & Middleton, 1996; Engeström et al., 1999; Blackler and Crump, 2000), socio-cultural theory (Billett, 2001; Cole, 1996), and cultural perspectives on organisational learning (Cook & Yanow, 1993; Yanow, 2003) also highlights the embedded nature of practice, although some of these studies struggle to overcome mind-practice dualism.

The dimension of skill development that relates to understanding of, and in, practice has largely been overlooked in the Dreyfus and other stage models and in the application of these models to various professional skill areas. While the Dreyfus model recognises that the professional may progressively become more attuned to situations encountered in practice, the nature of the specific understanding being formed is not made explicit. Below we explore the significance of this neglected dimension of skill development.

Embodied Understanding of Practice as a Base for Professional Skill

As noted above, professional skill, such as teaching, nursing, or managing, has traditionally been seen as comprising a specific set of knowledge and skills that are acquired through formal education or at work. Dreyfus and Dreyfus challenged and extended this view by demonstrating that context-free knowledge and skills are not sufficient for progression to advanced skill levels. Highly skilled performance, instead, involves intuitive assessment of each situation against the background of previous experience. It involves skilful know-how.

Similar to the investigation by Dreyfus and Dreyfus, a range of empirical studies in various fields such as education (Borko et al., 2000; Schön, 1983; Seely Brown & Duguid, 1991) management (Barley, 1999; Watson, 1994; Sandberg, 1994, 2000, 2001; Sandberg & Pinnington, in preparation), medicine (Stålsby Lundborg, Wahlström & Dall'Alba, 1999) and sociology (Atkinson, 1988; Barley, 1996; Fielding, 1988a, 1988b; Garfinkel, 1986; Kusterer, 1978; Livingston, 1987; Tyre & Von Hippel, 1997) have provided compelling evidence that professional skill is not primarily constituted by a set of attributes that have been acquired through formal training or at work.

Based on recent empirical research (Dall'Alba, 2002, 2004, in preparation; Dall'Alba & Sandberg, 1996; Sandberg, 1994, 2000, 2001; Sandberg & Pinnington, in preparation), we argue that an embodied understanding of practice, rather than attributes, forms the basis for professional skill and its development. More specifically, the knowledge and skills that professionals use in performing their work depend upon their embodied understanding of the practice in question. The professionals' way of understanding their practice forms and organizes their knowledge and skills into a particular form of professional skill. When practice is understood in a certain way, knowledge and skills will be developed accordingly. For example, when teaching is understood as knowledge transfer, efforts to improve tend to focus on the

teachers' presentation of content. When teaching is understood as facilitating learning, developing skill in monitoring and enhancing the learning that occurs is emphasised. In other words, the way in which professional practice is understood, in an embodied sense, is fundamental to how the practice in question is performed and developed, both by individuals and collectively. Further exploration and elaboration is needed to extend and deepen our understanding of the ways in which embodied understanding of professional practice is interrelated with performance and development of that practice.

Variation in Embodied Understanding within a Single Skill Level

Not only has empirical research highlighted that embodied understanding of practice forms the base for the development of professional skill, it also demonstrates that both experienced and inexperienced professionals understand and engage in practice in contrasting ways (Billett, 2001; Borko et al., 2000; Dall'Alba, 1998, 2002, 2004, in preparation; Hunt, 1976; Sandberg, 1994, 2000; Sandberg & Pinnington, in preparation; Stålsby Lundborg, Wahlström, & Dall'Alba, 1999). This is the case even at one level of skill acquisition within the Dreyfus stage model (see, for example, Dall'Alba, 1998, 2002, 2004, in preparation; Sandberg, 1994, 2000; Sandberg & Pinnington, in preparation).

Interestingly, further support for such variation within groups comes from empirical studies that set out to explore differences between novice and expert teachers (e.g., Carter et al., 1988; Livingston & Borko, 1989). In reporting the results, differences that were the focus of the studies are emphasised. However, mention is made in passing that there was also variation within the groups. For instance, Kathy Carter and her colleagues noted that "individual variance in responses to the [experimental, visual] materials presented sometimes appeared as great within each group as it was between groups" (p. 31). Variation within groups could be

considered an important research result, but in each study it was veiled by an emphasis on exploring differences at two distinct stages of development, namely, novices and experts.

In a similar vein, Engeström and Miettinen (1999) point out a limitation of much research on communities of practice, which arguably also applies to novice-expert studies focusing on differences between groups. They note that skill development is primarily regarded as:

a one-way movement from the periphery, occupied by novices, to the center, inhabited by experienced masters of the given practice. What seems to be missing is movement outward and in unexpected directions: questioning of authority, criticism, innovation, initiation of change. Instability and inner contradictions of practice are all but missing (p. 12).

Variation at a single level of skill is consistent with the notion of practice as dynamic and pluralistic. A longitudinal study of medical students will be used below to demonstrate variation in understanding of professional practice within a single skill level. In this longitudinal study, 13 medical students were interviewed and observed in consultation with patients during clinical placements that occurred within a 5.5 year medical program. The focus of the interviews and observations was the students' embodied understanding of medical practice and the formation of professional ways-of-being in the context of traditions of medical practice.

Below we illustrate different understandings of medical practice among the students during the first clinical component, which occurred in their third year of the program following two years of pre-clinical studies. For the purpose of illustration we have selected two students, here called Max and Ingrid, who demonstrate contrasting ways of understanding and engaging in medical practice. Further variation was evident among the remaining students in the study, so Max and Ingrid are not unusual in this respect. Both Max and Ingrid were interviewed about a

consultation with a specific patient and they described how they saw the central task of a medical doctor. Their descriptions were consistent with observations of their practice. (For further exploration of this form of consistency see Dall'Alba, 2002).

Max described the central task of a medical doctor as selecting among possible solutions to a patient's problem and informing the patient when no solution is available:

The patient comes because they have some kind of problem and then you're to find a solution to it. Then there's a series of solutions that the health care system has available and then there are a number of problems that fall outside it. But in some way since they [patients] come here the task must be to even try to solve those problems or tell them that you can't solve the problems and at least clarify a bit. So it's this sorting that is central anyway. (Student 1, semester 6, p.21)

Ingrid demonstrated a different understanding of medical practice, which emphasised taking care of patients in a manner appropriate to each patient:

Find out how the patient is feeling and what I can do about it, maybe you can say. It isn't only about collecting information [during the consultation], but also a matter of taking care of the patient, in the patient's way.... Even if two people come in with exactly the same symptoms and the same sickness profile you might treat them differently, depending upon their expectations and motivation about what should be done. That's my view. You don't only take care of the heart or whatever. You might do it in different ways that suit the patient best. (Student 25, semester 6, pp.12-13)

Both these students would be classified as novices according to the Dreyfus stage model, as they were beginning their clinical studies and attempting to orient themselves within the complex world of medicine. However, the students understood and performed medical practice in distinctly different ways. Max understood medical practice in terms of selecting among the

range of solutions to a patient's problem that the health care system has to offer, as well as informing the patient when no solution was available. This approach involves taking the health care system as the frame of reference and attempting to match the patient's problem against the available solutions. In contrast, for Ingrid a health problem was embedded within the context of the patient's broader life situation, including expectations and motivation to deal with the health problem. The task at hand involved taking this life situation as the frame of reference and seeking to find a solution that works for each patient. Classifying both these students as novices according to the Dreyfus stage model veils what we consider to be significant differences in their understanding of the professional practice for which they were preparing.

Not only did the students' understanding of medical practice vary at the beginning of their clinical studies but also on completion of the pre-medical program, with consequences for the form of health care, broadly defined, which their patients received. The development of their understanding during this period follows the pattern identified by Martin Heidegger (1962/1927) as an unfolding circularity. An unfolding circularity means that developing understanding presupposes and elaborates something already understood. (Further evidence of unfolding circularity among university students in non-medical contexts can be seen in an empirical study by Marton, Dall'Alba, & Beaty, 1993). This view of development is outlined and illustrated below and then considered in relation to the Dreyfus stage model.

Understanding as Unfolding Circularity

Consistent with Merleau-Ponty's 'lived body', understanding for Heidegger is not primarily a cognitive attribute we possess. Instead, understanding is a basic form of human existence in terms of something we *do* and at the same time *are*:

We sometimes use the expression 'understanding something' with the signification of 'being able to manage something', 'being a match for it', 'being competent to do

something'. In understanding, as an *existentiale*, that which we have such competence over is not a 'what', but Being as existing (Heidegger, 1962/1927, p. 183).

According to Heidegger, we develop our understanding of something through our interpretation of it. Interpretation is a mode of understanding, which clarifies what we have already understood. For example, when medical students or experienced medical practitioners meet each patient, they interpret these encounters within their current embodied understanding of medical practice (Dall'Alba, in preparation). This means that their previous understanding of medical practice is reproduced to a large extent in each new encounter. In other words, their previous understanding stipulates how they interpret medical practice in each new encounter of it. In this sense, the development of their understanding is circular.

At a general level, the Heideggerian notion of the circular development of understanding is similar to Dewey's (1938) skill development as ongoing inquiry. More particularly, it has similarities with Dewey's notion of habit and continuity of experience. According to Dewey:

The basic characteristic of habit is that every experience enacted and undergone modifies the one who acts and undergoes, while the modification affects, whether we wish it or not, the quality of subsequent experience.... From this point of view, the principle of continuity of experience means that every experience both takes up something from those which have gone before and modifies in some way the quality of those which come after (Dewey, 1938, pp.26-27)⁴

Not only is the development of understanding circular, but understanding is always embedded within a particular practice context, as noted previously. For medical students and experienced practitioners encountering patients, the health care system and its function in relation to citizens' health is such a context. It provides both medical practice as a phenomenon to interpret and the background to which medical practice refers and belongs. The

embeddedness of interpretation within this practice context gives rise to an unfolding circularity as understanding develops for both individual professionals and the profession as a whole.

Unfolding circularity was evident in the longitudinal study of medical students outlined above. Over time, all the students in the study developed greater confidence and more fluent performance of various routines and procedures relating to medical practice. However, the part that these routines and procedures played in their practice of medicine varied according to their embodied understanding of that practice. The development of this understanding over time took its point of departure from, and was delimited by, the students' understanding when they embarked on clinical studies. For instance, for Ingrid a health problem was part of a patient's life, while the medical practitioner's role was to assist the patient with such a health problem. These two aspects, the emphasis on the patient's life or situation and assisting patients with health problems, were recurring themes for her. Immediately prior to completing the medical program, she responded to an interview question about the role of a medical practitioner, as follows:

To help and be available. Either helping by listening, that's a type of help. Or helping by relieving pain. Or helping by operating. Or helping by comforting.... I see my work as a service to someone else. And I'm available to someone else and offer them something.

[Interviewer: Mm. And what do you offer, then?]

Mm, the knowledge you have, both in the area, the pure medical knowledge. Perhaps also knowledge about how to listen. And knowledge that you don't become afraid when someone begins to cry or you comfort them, if you know what I mean. That's what I have to offer. (Student 25, semester 11, pp. 53-53)

Later in the interview Ingrid summed up by describing a good doctor as follows: "I think it's someone who wants to help, on the patient's terms" (student 25, semester 11, p.64). Similarly,

“someone who’s available and who helps in the way that’s needed, depending on the situation and circumstances” (student 25, semester 11, p.65).

Initially Ingrid emphasised helping each patient in a way that was relevant for him or her. Over time, her understanding of what this meant and her confidence in achieving it developed progressively. She identified ways in which the various specialist areas within health care could all contribute to this end, as well as some of the obstacles in place. She came to recognise potential benefits and risks associated with her role as a health professional and the impact upon each patient encounter. For instance, she pointed out the risk of treating as unimportant those ailments that might be perceived by the medical doctor as minor when compared with more serious health problems. By the end of the program, Ingrid’s understanding of medical practice as helping the patient (through diagnosis, treatment, listening, comforting and so on) in a manner that the patient considers appropriate to his or her circumstances was considerably richer and more complex than when she began.

In contrast, Max was still sorting, albeit it in a more informed way, while excluding from medical care a range of conditions that Ingrid included:

The basic thing is to uncover and cure and ease sicknesses. And then I’ve understood that it’s very much about things that are on the margin of what is sickness ... and a lot that falls outside [of sickness] which you have to deal with.... There are many social problems ... that are about the social situation and personality of the person ... that you can’t diagnose, but they have lots of other underlying problems that you can see are probably at the root of it all.... They fall outside what you think is actually the doctor’s role. (Student 1, semester 11, p. 29-31)

As we have noted above, the remaining students in this longitudinal study varied in their understanding of medical practice and demonstrated unfolding circularity of understanding, as

did Ingrid and Max. We have argued that embodied understanding of practice forms the basis for the professional skill being developed. The way in which practice is understood forms and organizes specific knowledge and skills into a particular form of professional skill, as in the case of Ingrid and Max. Their ways of understanding medical practice illustrate variation in understanding of practice at a single skill level, as well as an unfolding circularity of understanding.

Re-examining Step-wise Progression

As noted previously, both inexperienced and experienced practitioners understand the situations they encounter in a variety of markedly different ways. For this reason, we consider a fixed sequence of professional development unlikely. Additional empirical evidence that challenges a fixed sequence can be found in Michael Huberman's (1989) study of teachers' professional life cycle, which demonstrates a range of development trajectories. Below we examine the evidence for step-wise progression through a series of defined stages as proposed by Dreyfus and Dreyfus and others (e.g., Benner, 1984; Benner, Tanner, & Chesla, 1996) in the light of the evidence presented above.

Although Dreyfus and Dreyfus present examples to illustrate each stage within their model, no empirical evidence is presented by them, or in other empirical studies, to support the claim that progression occurs in a step-wise manner from one stage to the next. Nor do Dreyfus and Dreyfus provide details in their study about the way they investigated skill acquisition. The only information they provide about the process they engaged in is as follows:

We studied the skill-acquisition process of airline pilots, chess players, automobile drivers, and adult learners of a second language and observed a common pattern in all cases, which we call the *five stages of skill acquisition*. (1986, p. 20, emphasis in original)

They do not indicate the form the investigations took, the approach they took as investigators, how many participants were involved, in what contexts, and the process involved in formulating their model. The examples that Dreyfus and Dreyfus provide in support of their model suggest they have conducted cross-sectional investigations at different levels of experience and/or relied upon retrospective accounts of how skill had been acquired. In her empirical studies, Benner (1984; Benner, Tanner, & Chesla, 1996) makes clear, however, that her use of the Dreyfus stage model is based upon interviews and observations of nurses at different levels of experience in clinical contexts.

This means that in Benner's research, and apparently also in the Dreyfus and Dreyfus study, skill acquisition has not been investigated over time. Instead, step-wise development has been assumed from cross-sectional studies⁵, as is also the case in other stage models of professional development. It could be argued that cross-sectional studies are likely to give rise to a stage notion of development as they focus on skill at different levels of experience without exploring the nature of the development over time. Problems are likely to arise when such investigations are used in making assumptions about how development occurs over time. Empirical evidence in support of such assumptions is lacking or, in any event, has not been put forward. Recent empirical research, including longitudinal studies of the kind reported above, raises questions about assuming step-wise development of professional skill, while proffering evidence that counters such an assumption (see, for example, Dall'Alba, 2004, in preparation; Marton, Dall'Alba, & Beaty, 1993; Ollis, Macpherson & Collins, 2006; Sandberg, 1994; Sandberg & Pinnington, in preparation).

Why Some Become Expert but Not Others

A related limitation of stage models of development concerns their difficulty in accounting for the achievement of expert status by some but not others, even committed

individuals with extensive experience. On this question, the explanations put forward by Dreyfus and Dreyfus show similarities to those aligned with models developed in cognitive psychology. These are the kinds of models that Dreyfus and Dreyfus otherwise criticise. In our view, the limitations of these explanations are a consequence of overlooking the professional skill that is being developed. In other words, unfolding, embodied understanding of practice, embedded within specific practice contexts, is overlooked.

One view within cognitive psychology for accounting for the achievement of expert status is that a necessary condition is accurate and deliberate practice (see, for example, Ericsson, 1996). Another view is that deliberate practice is a necessary, but not sufficient, condition as talent also plays an important role in the development of expert skill (see, for example, Sternberg & Ben-Zeev, 2001; Sternberg et al., 2000). Dreyfus and Dreyfus (1986, p. 35) also proffer the tautology that “the ones who are talented will learn to perform as experts”. In addition, they propose an alternative explanation that few become expert in some areas of skill, such as chess, while in other areas many will become expert, such as in driving a car (p. 21). However, they make no attempt to identify those features of skill areas that have significance for skill development. For instance, what features of car driving or chess playing are of significance for achieving expert levels of skill? While these various attempts at explanation potentially have some merit, they are inadequate for understanding why some, but not others, achieve expert status. These explanations are directed to the skill area, on the one hand, and the individual, on the other, but they overlook the relation between the two.

In parallel with the empirical study by Benner and her colleagues (Benner, Tanner, & Chesla, 1996), Jane Rubin studied a group of nurses whose practice she identified as not following the stage-wise development identified as typical in the Dreyfus model. Rubin investigated a group of nurses with more than five years nursing experience who had not

achieved expert levels of practice and drew conclusions about their development. She did not study this development longitudinally. The group of nurses paralleled the experts studied by Benner and her colleagues in terms of length of experience. Rubin argued that these nurses' failure to achieve expert status could not be reduced to individual idiosyncrasies or social factors impinging upon nursing. Instead, she attributed this failure to the nurses' "lack of knowledge of the qualitative distinctions that are embodied in expert nursing practice" (Rubin in Benner, Tanner, & Chesla, 1996, p.191). In other words, these nurses were unable to recognise qualitative distinctions between clinical phenomena and, presumably, were not aware of the relevance or necessity of doing so. Rather than developing skilled know-how, broadly defined, these nurses were constrained by their focus on symptoms indicating the patient's physical condition. Implicit in Rubin's analysis is the notion that these nurses understood nursing practice differently from their more expert colleagues.

Rubin's analysis lends support to the way in which we account for patterns of professional development. Consistent with our view of professional skill, we see patterns of professional development as arising from the relation between person (with a particular history located within local and broader practice contexts) and professional practice, which is dynamic, inter-subjective, and pluralistic. An unfolding circularity of understanding constitutes such a relation between person and practice. It provides an alternative view of why some become expert while others do not, as integral to the notion of unfolding circularity is the possibility that current understanding presents obstacles to achieving more complex or comprehensive understanding. In such cases, subsequent development consists of refinement of an existing understanding without the kind of transformation that would involve progression to more complex and comprehensive levels.

Results from empirical research (e.g., Benner, 1986; Benner, Tanner & Chesla, 1996; Dall'Alba, 1998, 2004; Sandberg, 1994, 2000; Sandberg & Pinnington, in preparation; Stålsby Lundborg, Wahlström & Dall'Alba, 1999) demonstrate that comprehensive understandings of practice are infrequent in the professions. This suggests that refinement of existing understanding, rather than transformation to more complex understanding of practice, is likely to be the norm in the professions rather than an exception. In order to better understand why this is the case, further research on the nature of professional development over time would be required.

Promoting Skill Development

An additional difficulty arises as a result of stage models overlooking the professional skill that is being developed. This difficulty relates to their implications for promoting skill development. For instance, when Dreyfus and Dreyfus explore skill acquisition they make a strong case for directing attention to know-how or fluid performance that does not consist of continual, rational deliberation. Their emphasis on know-how gains support from the more elaborated empirical work of Benner and her colleagues. Such an emphasis is consistent with the skilled performance of experienced professionals in a range of professions (Livingston & Borko, 1989; Heidegger, 1962/1927; Rolf, Ekstedt, & Barnett, 1993; Sandberg & Pinnington, in preparation; Schön, 1983). On the other hand, know-how is not adequately accounted for in empirical studies of professional skill that adopt a traditional view (such as Simon, 1979; Taylor, 1911; Veres III, Locklear, & Sims, 1990). However, neither Dreyfus and Dreyfus (1986) nor Benner (1984) consistently maintain a focus on know-how when they turn their attention to promoting the development of professional skill. The difficulties they face in maintaining a focus on know-how are a consequence of their emphasis on a fixed sequence of stages

regardless of the practice in question. As we have argued above, this emphasis on stages conceals the skill, broadly defined, that is being developed, as in other stage models.

In contrast to their emphasis on know-how, Dreyfus and Dreyfus reinforce or take for granted traditional forms of instruction, such as the provision of rules to novices, while pointing out the value of content- and context-specific knowledge for those with experience. This leaves unanswered the question of how declarative knowledge such as rules can form the basis for, or become integrated with, skilled know-how. Donald Schön (1987, pp. 97-98) argued against such an approach, as follows, using the example of the design process within architecture:

Designing is a holistic process, and the studio master cannot explain "thinking architecturally" by listing component design skills. [Authors' note: Or, one could argue, by listing rules to be followed.] A student cannot understand and acquire each component skill in the sense in which "thinking architecturally" requires it, until he has experienced that component in the context of a whole process.

Furthermore, the focus on stages that Dreyfus and Dreyfus adopt veils the variation in novices' understanding of the 'same' rule and in the actions they take in accordance with this understanding. An alternative to rule-giving would be promoting the participation of novices in teams of skilled professionals who critically reflect upon understandings of practice that are evident in day-to-day workplace routines and procedures. Such a strategy implies a focus on developing understanding of, and in, practice. Processes such as this could contribute to progressively engaging the novices with the contexts and issues they are to learn to tackle, while enhancing their understanding in meaningful and effective ways. The key to success in such a venture is likely to be increasingly active participation by the novices, rather than having them adopt a position of observer or follower of rules, as a growing body of empirical research

suggests (e.g., Dall'Alba, 1993, in preparation; Lave & Wenger, 1991; Schön, 1995; Wenger, 1998).

Benner (1984), too, makes traditional assumptions about instruction similar to that of Dreyfus and Dreyfus when she proposes principles for educating nurses. These assumptions contrast with her rich descriptions of nursing practice, which provide compelling evidence of the situational character of professional skill (Benner, 1984; Benner, Tanner, & Chesla, 1996). Her research results challenge the traditional view that professional skill consists of detailed knowledge and skills that are independent of context. They also demonstrate that professional development involves not simply accumulating knowledge and skills, but learning to deal with the situations encountered in qualitatively different and more complex ways (as Borko et al., 1997, 2000 also demonstrate empirically in relation to teaching).

Despite highlighting professional skill as situational, Benner (1984) focuses on form or method of instruction in a decontextualised manner when considering pedagogy. For instance, in line with the Dreyfus stage model, she proposes that "since novices have no experience of the situation they face, they must be given rules to guide their performance" (p.21). On the other hand, "proficient performers are best taught by use of case studies where their ability to grasp the situation is solicited and taxed" (p.30). Such general recommendations are problematic in the sense that a particular method or learning situation can be more or less effective depending upon how it is used and for what purpose. Problem-based learning in a range of educational programs has demonstrated, for example, that cases can be productively used throughout undergraduate education (see, for example, Boud & Feletti, 1991). Furthermore, no single method or form of learning activity is likely to capture the complexity of professional skill at any one level of experience.

A consequence of focusing on stages and overlooking the understanding that is being developed is demonstrated in the following statement by Benner (1984, p. 182):

Since there is a qualitative difference between the competent level and higher levels (proficient and expert), a competent nurse might be the most suitable preceptor for the advanced beginner – that is, the newly graduated nurse; an instructor close to the learner's skill level may be more aware of the learner's readiness than a nurse at a more advanced skill level. This has not been tested, but it is a provocative hypothesis.

The hypothesis is surely provocative, as it overlooks not only the understanding to be developed but also the appropriateness of the instructor's understanding of professional practice for this important task. This is a clear example of veiling what is being developed through a focus on stages.

In later empirical work by Benner and her colleagues (Benner, Tanner, & Chesla, 1996), each stage of the Dreyfus model is exemplified through narratives, as was the case in the earlier study. However, in the later work, the authors more actively reflect upon what the narratives reveal about the nature of skilled nursing practice. In other words, as well as illustrating the Dreyfus stages, thoughtful reflections on the narratives are explicitly used in clarifying what skilled nursing involves. Consistent with their achievements in describing skilled nursing, their recommendations for nursing education demonstrate a stronger focus on what is to be learned when compared with the earlier study. This greater emphasis on the nature of nursing practice led to enhanced consistency in the recommendations they made for nursing education, demonstrating that the way in which professional skill is delimited impacts upon professional education, as noted in the introduction to this article.

Abstract Rules to Concrete Experience

A further consequence of focusing on stages is evident when Dreyfus and Dreyfus claim that skill acquisition by adults proceeds from abstract rules towards concrete experience and can be contrasted with children progressing from concrete experience to abstract reasoning (p. 35). This claim confuses separate issues, namely, abstraction of 'rules' or principles based on experience and pedagogical strategies to be used in professional skill development. As Jean Piaget's work in early child development illustrates, experience of concrete examples can enable children to understand a principle, such as the conservation of volume. Unlike Piaget's children, the 'rules' that are typically provided to novices in instructional settings are not abstract principles that these novices understand from concrete experience, as Dreyfus and Dreyfus recognise. In other words, the provision of rules to novices represents a pedagogical strategy, not necessarily a preferred or even effective way of learning by novices.

Just as children derive abstract principles from concrete experience so, too, do adults who learn to intuitively and holistically recognise and assess each new situation on the basis of previous experience of similar situations. The key here is to avoid losing the richness and nuance of the situation in the interests of formulating generalisable rules for a broad range of only superficially similar situations. The same principle applies to children's efforts to abstract from concrete experience, although the level of complexity they can grasp is likely to be more limited. Not only is abstraction involved on the path to developing expert skill, but also abstract principles based on concrete experience may be formulated into theories or models, as Dreyfus and Dreyfus have shown. Once again, a focus on fixed stages that overlooks what is being developed led Dreyfus and Dreyfus to unsustainable conclusions about the nature of development and ways in which it can be promoted.

An Alternative Model of Professional Development

Models such as the Dreyfus stage model have contributed to our understanding of professional development by highlighting progression that often accompanies experience, the situational character of the professional skill being formed, and know-how that extends beyond rational deliberation. However, in stage models of professional development, step-wise progression has typically been assumed in the absence of exploring the nature of this development over extended periods of time. More importantly, we have argued, a focus on stages veils more fundamental aspects of professional development. In particular, this emphasis has directed attention away from what is being developed. Below we propose an alternative model of professional development that draws upon the contributions of previous research, including the Dreyfus stage model, while seeking to overcome some limitations. Our alternative model provides a new and expanded framework for research on professional development and enhancement of professional practice, as we outline below.

Horizontal and Vertical Dimensions of Professional Skill Development

As noted above, we acknowledge the contribution of the Dreyfus stage model in highlighting development in skill that often accompanies increased experience. Along with Dreyfus and Dreyfus, we recognise that a necessary, but not sufficient, condition for achieving skilful know-how is embeddedness within the situations encountered, which demands experience of those situations. We refer to this skill progression with increasing experience as a *horizontal* dimension of skill development. Consistent with our critique of the Dreyfus and other stage models, we make no assumption that such progression follows a fixed sequence of stages.

In our critique, we have also presented empirical evidence that professional practice is understood and carried out in significantly different ways, even at a single skill level. This variation in understanding of, and in, practice constitutes a second dimension of professional

skill development, which we refer to as a *vertical* dimension. The vertical dimension calls attention to variation in embodied understanding of practice. In line with previous research of the kind referred to in this article, in any one social, historical and cultural context, there is likely to be a limited number of qualitatively different ways in which a particular practice is understood and carried out.

Our model of professional development can be represented diagrammatically as shown in Figure 1. The particular points that occur along each axis will depend upon the area of professional skill being examined, as the examples from the longitudinal study of medical students illustrate. For instance, understandings of medical practice and skill levels within medicine are likely to differ from those for teaching practice. In addition, these understandings may show some variation from one social, historical, or cultural context to another, in line with the dynamic, inter-subjective, pluralistic nature of practice. Establishing the forms these understandings take in a specific context requires empirical investigation.

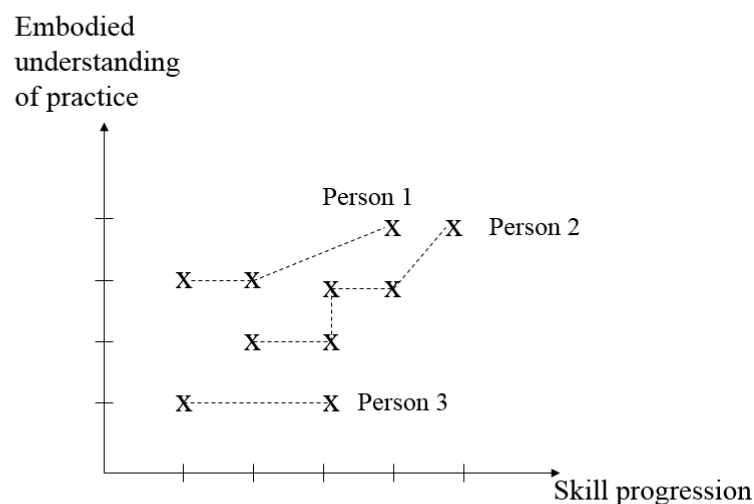


FIGURE 1. Model for development of professional skill with hypothetical development trajectories.

The combination of the horizontal and vertical dimensions of professional skill development in our model allows for a range of development trajectories, albeit within particular practice contexts. Some professionals may devote most of their working lives to

refining an existing understanding, making considerable progress along the horizontal dimension with limited change on the vertical. For instance, in her professional life, Ingrid may continue to assist patients with health problems within the context of their broader life situations. She may become increasingly skilled in her encounters with patients, their families and friends, as well as in advocating for the needs of her patients with relevant health authorities. In this way, Ingrid's professional development would show considerable skill progression (along the horizontal axis), but not transformation in embodied understanding of medical practice (along the vertical axis).

Others professionals may direct their energies to change on both dimensions, with significant transformation in embodied understanding of practice alongside skill progression. For example, during his professional life Max may become increasingly frustrated by patients who continually seek assistance in ways he regards as falling outside medical care. He may be confronted and challenged by interactions with colleagues who provide medical care to such patients, leading to a transformation of his understanding of what medical practice entails. As Max begins to embody and become fluent in performing a more inclusive medical practice, his development would be shown along both the horizontal and vertical axes.

While the examples above are provided for the purpose of illustration, the form and shape of individual trajectories over time is an empirical question that requires further research. This research would be longitudinal, with a focus on both what constitutes the professional skill in question and how this skilfulness develops over time. For example, ethnographic and case studies could be carried out that include observations of practice over time, in combination with interviews about the focus and purpose of that practice, as understood by the professionals concerned. By exploring several cases within a single profession, variation in enactment of the professional skill in question can be investigated. (For an example of such a study, see

Dall'Alba, in preparation.) This research could be complemented by investigation of how the clients of these professionals experience the service provided over time, as well as by research into professional development trajectories across a range of professions.

Outlining Some Implications

Against the background of our critique of stage models and the alternative model of professional development proposed above, we now turn our attention to some implications for enhancing professional development. A principal point of departure for these implications is the need for a substantial shift away from a traditional focus on transfer of knowledge and skills to developing understanding of, and in, professional practice⁶. Such a shift would mean promoting development of professional ways-of-being that can deal with the complexities, ambiguities, and dynamic change inherent in professional practice. Below we outline implications for professional education, management of workplace practices including professional development in the workplace, and research on professional development.

Implications for Professional Education

In formal professional education programs and courses, a focus on understanding in practice in the broad sense described above has implications for curriculum design, learning by participants, pedagogy, design of learning environments, assessment of learning, and evaluation of programs, courses and teaching. A fundamental principle in all of these spheres is constant monitoring of participants' understanding of, and in, practice as an input to the design and continual revision of programs and courses. Central questions are: How do participants understand the practice in question? What implications does this have for the issues that need to be addressed in the course and/or program? Monitoring of understanding can include formal assessment – both formative and summative – as well as informal means of obtaining feedback. Informal feedback can be obtained through means such as posing questions directed to

understanding, observing how participants deal with learning situations and what they learn, and attending to comments from participants that provide evidence of their understanding or their responses to a course or program.

A challenge in *curriculum design* is to create opportunities for learning that both call into question and extend participants' current understanding of, and in, practice. Efforts of this kind are only likely to be successful when the focus throughout a course or program is on development of such understanding. This means that the components of a course or program would highlight various aspects of the practice in question, as well as integrating these aspects. Understanding is unlikely to be transformed simply as a by-product of a course or program that does not have such a focus. In the longitudinal study of medical students outlined previously, it is evident that Ingrid and Max had relatively resilient understandings of medical practice. This is not surprising, given these understandings formed the base for emerging professional ways-of-being. These students were exposed to the same program of study, yet interpreted the content within their existing understandings of what medical practice entailed. Acquiring knowledge about sicknesses and symptoms allowed Max to focus on sorting patients' health problems into those that belonged to medical practice and those that did not. In contrast, knowledge about sicknesses and symptoms allowed Ingrid to assist patients with health problems in ways that took into account each patient's expectations and situation. (In their empirical research on teacher professional development, Borko and colleagues (1997, 2000) also report that the teachers with whom they worked generally interpreted the new ideas they were exposed to according to their existing understandings of teaching.)

Further research is needed into how professional education can promote the development of understanding of, and in, practice. This research could contribute to addressing the substantial empirical evidence that comprehensive understandings of practice are uncommon, both

immediately following professional education programs and among experienced professionals (e.g., Benner, 1984; Benner, Tanner, & Chesla, 1996; Dall’Alba, 2004; Sandberg, 1994, 2000; Sandberg & Pinnington, in preparation; Stålsby Lundborg, Wahlström, & Dall’Alba, 1999).

Consistent with the design of curricula that focus on understanding in practice, *learning by participants* must also achieve this goal. Continual monitoring of participants’ understanding, as outlined above, is essential for ensuring participants’ learning is directed to this end. All aspects of *pedagogy* must also have such a focus. In particular, understanding *of* practice must be integrated with understanding *in* practice to form a practical understanding that is both sound and skilful. For instance, teachers must not only be up-to-date with developments in the field, as well as attentive to students’ needs and parents’ or carers’ requirements, but also able to teach in a way that takes account of all these (see also Ball & Cohen, 1999). Deborah Ball and David Cohen raise a related issue when they argue for attention to the question: “What might it take to learn in practice, and to learn from practice?” (p. 10). Similarly, medical practitioners must not only be knowledgeable about sicknesses, symptoms and effective communication, but also skilful in integrating this knowledge when dealing with patients, their illnesses, and their relatives and friends. The extent to which such learning is achieved and the aspects of curriculum design that promote such achievement are questions for research.

A consequence of a focus on understanding of, and in, practice is that pedagogy must be consistent with the practice situations to which learning is directed. Pedagogy that focuses on promoting acquisition of decontextualised knowledge and skills fails to address issues concerning when it is appropriate to use such knowledge and skills, how to use them, and to what purpose. Furthermore, given the breadth and complexity of professional practice, no single pedagogical method can be a panacea.

Similarly, *the learning environment* can promote or hinder learning that challenges and extends current understanding (Ball & Cohen, 1999; Borko & Putnam, 1996; Borko et al., 1997; Borko et al., 2000; Dall’Alba, 1993; Hargreaves & Fullan, 1992; Lave & Wenger, 1991; Putnam & Borko, 2000; Schön, 1995; Seely Brown, Collins, & Duguid, 1989). This environment includes the extent to which learners are actively engaged in learning processes, encouraged to supportively challenge and contribute to each other’s development, and required to be reflective about what and how they are learning. Further research is needed into the consistency of pedagogy with the understandings of practice for which professional education programs and courses aim, as well as into the features of learning environments that promote the achievement of this aim.

If curriculum design, learning by participants, pedagogy, and design of learning environments are to promote a focus on understanding of, and in, practice, *assessment of learning* has a key role to play. Assessment has been shown to have substantial impact on what is learned and how learning occurs (e.g., Brown & Glasner, 1999; McDowell, 1995; Newble & Jaeger, 1983; Shepard, 2000). A focus on embodied understanding of practice can be promoted, then, by rewarding participants for achieving such understanding through formative and summative assessment. Given the complexity of the professions, there is a risk that assessment in professional education programs emphasises readily measurable knowledge and skills, rather than understanding of and in practice, taking into account the experience of participants. Research on the effectiveness of assessment in both measuring and achieving a focus on understanding of and in practice could contribute to knowledge in this area.

In parallel with assessment of learning, *evaluation of programs, courses and teaching* has a part to play in promoting embodied understanding of practice. A range of stakeholders can be involved in providing evaluative comments. Evaluation can include the use of formal,

systematic instruments (including pieces of assessment of learning), as well as informal means of obtaining feedback, as noted above for course or program participants. The most crucial principle of evaluation for enhancing embodied understanding of practice is that the various forms of feedback obtained are interrogated and used in ensuring a focus on such understanding. Research is needed that documents such reflective practice, which is directed to enhancing understanding of, and in, practice.

Implications for Workplace Practices

As noted in the introduction to this article, professional development in the workplace not only takes the form of formal courses, but also learning-on-the-job. As this more informal learning is part of the day-to-day work of professionals, it may initially appear that it cannot be enhanced. On closer examination, we see that professionals and the organisations where they are employed influence the kinds of learning that take place (Borko & Putnam, 1996; Borko et al., 1997; Borko et al., 2000; Davies, 2003; McWilliam, 2002).

If understanding of, and in, practice is to be promoted as part of professionals' work, the workplace must encourage *critical reflection on practice* in a manner that enhances this understanding. For instance, in some workplaces, groups of professionals discuss the way in which they approach their work for the purpose of improving it. Such discussions incorporate understanding of what the practice in question involves, although this may not be made explicit. A necessary feature of enhancing understanding through critical reflection on practice is becoming aware of one's own understanding and its enactment in practice. A second feature is gaining exposure to other understandings of, and in, practice. These understandings must then be considered critically and evaluated in relation to each other, which has the potential to challenge and extend understanding (see also Ball & Cohen, 1999; Dall'Alba, 2005). Focused dialogue in the workplace can be used to bring about such reflection (Sandberg & Dall'Alba,

2006; Sandberg & Targama, in press). Further research is needed into exploring how, and to what extent, critical reflection on understanding and engaging in practice enhances that practice.

At the organisational level, too, there is scope for *critically reflecting upon the function of the organisation or the service it provides* in a way that calls into question, and extends, understanding of practice. In many workplaces, setting in place continual critical reflection and discussion would require substantial shifts in the current workplace culture of efficiency and performativity (Argyris & Schön, 1978; Borko & Putnam, 1996; Sandberg & Targama, in press; Wilson & Berne, 1999; Winter & Maisch, 1996). Research that embeds and explores the enhancement of understanding of, and in, practice within workplace settings is sorely needed.

Other features of workplaces that impact upon enhancing understanding of, and in, practice include: recruitment; salary scales; paths for career progression; appraisal of work performance; and opportunities for professional development, if they occur at all. The manner in which these features of the workplace are managed has the potential to promote or present obstacles to enhanced understanding of practice.

Recruitment processes influence both who is attracted to apply for positions and who is selected. Implicit in both of these is the way in which the practice in question is understood and performed. *Salary scales, career progression, and performance appraisal* impact upon the extent to which enhanced understanding of, and in, practice is recognised and rewarded, as well as promoting or discouraging attention to such understanding. *Opportunities provided for professional development* signal the importance placed on transforming embodied understanding of practice, as well as contributing to or undermining such a focus. Given the predominant focus in professional development on the acquisition of specific knowledge and skills, a shift from such a focus to enhancing understanding of, and in, practice in workplaces presents a significant challenge. Research that is directed to increasing knowledge about the

impact of workplace procedures on understanding of practice has the potential to contribute to promoting such understanding.

Implications for Research on Professional Development

The analysis we have presented in this paper calls into question the focus of much contemporary research on the development of professional skill in a range of professions. It has questioned the focus of such research and, consequently, the way in which the research has been conducted. Our argument is that research on professional skill that fails to incorporate embodied understanding of the practice in question is incomplete. We have proposed an alternative model of professional skill development, although we acknowledge a need for further empirical research about the pragmatic validity (Kvale, 1989; see also Dall’Alba, 2004; Sandberg, 2005) of this model.

The approach we have adopted and model we propose have highlighted some broad research questions about professional skill development that have received scant attention to date. These include: What constitutes professional skill in a range of professions? Why do some professionals perform better than others? How does skill development take place in terms of changing understanding and what is involved in transforming one understanding to another? What is the variation in professional skill at each level of experience within various fields of professional practice? How are the range of ways of understanding practice related to expertise in the sense of both fluent performance and effectiveness of professional practice? What form and shape do development trajectories take for a range of professions? How, and to what extent, can professional development be promoted in both formal education and workplace settings?

Conclusion

In the introduction to this article, we noted that professional skill development in educational institutions and in workplaces is based upon specific views of what is entailed in

such development. We pointed out that advocates of most contemporary models regard skill development as a progressive accumulation of a specific set of knowledge and skills, primarily acquired through practical experience. Dreyfus and Dreyfus challenged and extended these previous models, while retaining a view of skill development as step-wise progression. In their model they highlighted the progression that accompanies experience, the situational character of professional skill, and know-how that extends beyond rational deliberation.

While acknowledging their contribution, we have argued that a focus on a fixed sequence of stages veils or conceals more fundamental aspects of professional skill development, most particularly the skill that is being developed. Through our critique of stage models, we sought to contribute to unveiling professional development. More specifically, we propose that understanding of, and in, practice constitutes a fundamental dimension of professional skill development that is overlooked in previous models. We argued that the way in which professionals understand and perform their practice forms the basis for professional skill and its development.

Based on our critique, we proposed an alternative model of skill development that builds upon the strengths of previous models, while seeking to overcome their major limitations. Our model incorporates what we refer to for analytical purposes as horizontal and vertical dimensions. The horizontal dimension relates to the skill progression that accompanies experience, while the vertical dimension refers to variation in embodied understanding of practice. We make no assumption that development follows a fixed sequence of stages. Rather, the combination of horizontal and vertical dimensions of professional skill development in our model allows for a range of development trajectories. The form and shape that this development takes over time within particular professional contexts and fields is a question for empirical research.

The notion that professional skill development entails a combination of skill progression and embodied understanding of practice has significant implications for research and practice. In particular, in both research and practice there is a need for a substantial shift away from a focus on transfer of knowledge and skills to developing understanding of, and in, the practice in question.

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Footnotes

1. The influence of the Dreyfus model is considerably broader than empirical studies in which it has been used. Implications of the model for additional professions (e.g., librarianship (Perrone, 2004), artificial intelligence (Winograd & Flores, 1986), and coaching of sport (Bell, 1997)) are discussed in the research literature on professional development and on expertise.

2. Suzanne Wilson and Jennifer Berne (1999, p. 174) make a related point about traditional professional development activities for teachers when they point out that the crucial question of “what teachers learn (or do not learn)” from such activities has been overlooked.

3. Our critique of the Dreyfus stage model of skill acquisition does not undermine the arguments in *Mind over machine* about what computers can and cannot do. Rather, our analysis of professional skill and its development strengthens Dreyfus’ arguments on this issue, as well as supporting the emphasis on know-how (consistent with Heidegger, 1962/1927).

4. For further elaboration of the similarities between Merleau-Ponty’s lived body, Heidegger’s circular understanding, and Dewey’s habit and continuity of experience see Kesternbaum (1977) and Margolis (1998).

5. Dreyfus and Dreyfus criticised artificial intelligence researchers, such as Herbert Simon, for assumptions they make without supporting empirical evidence. Martin Ryan, Jan Fook and Linette Hawkins (1995) carried out a longitudinal study of social work students, whom they continued to follow after graduation. These authors make general comments about the application of the Dreyfus model to their data, with the consequence that the data are treated essentially as though they were cross-sectional. The nature of professional development over time is not critically explored in a way that would convincingly support or challenge the

Dreyfus model. This is a further example of the way in which a focus on stages veils aspects of professional development.

6. While the focus of this article is professional development, we acknowledge that the points we make about developing understanding of, and in, practice also apply to other areas of human action.

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