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Knowledge Creation and Knowledge Use in Professional Contexts

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ABSTRACT

This paper presents a radical reconceptualisation of the theory-practice problem in initial and continuing professional education, based on considering the influence of academic and professional contexts on knowledge operation and knowledge use. The first part is concerned with making important conceptual distinctions, the second with implications for the practice of professional education and the relationships between higher education and the professions.

The conceptual section of the paper first distinguishes different kinds of professional knowledge *with particular attention to generalisability (knowledge of particular cases, knowledge of precepts, knowledge of theory) and explicitness (codified knowledge, knowledge embedded in traditions, craft Knowledge, tacit knowledge, etc.). Then it takes Broudy's four* modes of knowledge use*—replication, application, interpretation, association—and illustrates their significance for understanding the theory-practice relationship in a number of professions. Finally it examines the influence of different* contexts of knowledge use, *such as research publications, academic coursework, policy-making, case conferences and personal action. It is argued that these contexts are especially important, because ideas become clarified and personalised during use; and have only limited meaning prior to use. Thus the context of use affects the way an idea is understood and there is only limited transfer of understanding between contexts.*

New knowledge is created both in the research community and in each professional community. But each places different valuations on different kinds of knowledge in a way that minimises their interpenetration. The particularistic nature of knowledge gained by practising professionals presents yet another barrier to knowledge creation: both its exchange with other professionals and its incorporation into theory are limited by its specificity, and often by its implicitness.

Higher education needs to develop an additional role to that of creator and transmitter of generalisable knowledge—that of enhancing the knowledge creation capacity of individuals and professional communities. This implies recognising that much of the relevant expertise lies outside the higher education system, but its development is limited by the lack of appropriate structures for knowledge exchange between higher education and the professions. This is matched by the lack of appropriate opportunities for mid-career professional education, whereby professionals can both (1) reflect on their experience, make it more explicit through having to share it, interpret it and recognise it as a basis for future

learning; and (2) escape from their experience in the sense of challenging traditional assumptions and acquiring new perspectives.

The practical implications for initial and continuing professional education are explored in the light of the foregoing analysis.

Introduction

Hitherto, the debate about professional education has largely focused on the relationship between selection and recruitment, the process of initial qualification (comprising various mixtures of coursework, examinations and supervised work experience) and subsequent practice. Continuing professional education (CPE) or post-qualification education (PQE) has received little attention in many professions; and has only been seriously studied in medicine and schoolteaching. Apart from a natural conservatism, this is probably because the financial arrangements for post-school education are dominated by the presumed needs of 16–21 year olds.

Behind the numerous policy issues, which have enlivened the debate about the appropriate form and structure for professional education, lies a remarkable ignorance about professional learning. Apart from the limited though valuable literature on professional socialisation, we know very little about what is learned during the period of initial qualification besides the content of formal examinations. Still less is known about subsequent learning, how and why professionals learn to apply, disregard or modify their initial training immediately after qualification; and to what extent continuing on-the-job or even off-the-job learning contributes to their professional maturation, updating, promotion or reorientation. Yet without such knowledge, attempts to plan or evaluate professional education are liable to be crude and misdirected.

Moreover, the need to consider professional learning in all its various forms and phases is critical. The work context dominates professional socialisation both during periods of practical experience prior to qualification and during the formative early years of professional practice. For every work setting that teaches and inspires the next generation of leaders for the profession, there are others that limit their development and perpetuate the weaknesses of the previous generation. There may be disagreement about where the best practice is to be found, but not about the limited proportion of young professionals who gain access to it. Moreover, even good practice is liable to decay over time, and the characteristics that bring quality to one generation of professionals may seem less important for the next. Both the ongoing development and the diffusion of good practice depend on the capacity of mid-career professionals to continue learning both on and off the job. Thus the quality of initial professional education and post-initial on-the-job learning depends on the quality of practice; and that, in turn, depends on the continuing education of mid-career professionals. The problems of initial qualification cannot be considered to be independent of those of post-qualification learning nor even of those of mid-career professional education.

This paper provides a framework for studying and developing professional learning which recognises and builds on the interdependence of its various aspects:— pre- and post-qualification, on-the-job and off-the-job, theory and practice. The first part is about *knowledge use* and seeks to clarify issues concerning different types of professional knowledge, different modes of application of knowledge, and the influence of context of use on the kind of learning which occurs. The second part then goes on to consider the related problem of *knowledge creation.* To what extent is professional knowledge created by research or in practice; and what is the relationship between the facilitation of knowledge creation and the promotion of knowledge use? These questions have profound significance for the relationship between higher education and the professions, and

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hence for the practice of initial and continuing professional education. The principal argument of this final section will be that higher education should reconceptualise its role in professional education. Apart from playing some part in initial and continuing education and pursuing research that contributes to professional knowledge, higher education should aim to enhance the knowledge creation and utilisation capacities of individual professionals and professional communities in general.

Different Kinds of Professional Knowledge

In normal circumstances, attempts to map out the knowledge requirements of a profession are associated with the design of training courses or the compilation of regulations concerning entry to the profession. The language of syllabus construction prevails, accompanied perhaps by some homilies about the aims of the profession. Knowledge of the kind that does not normally get included in syllabi will not be considered, as attention is focussed on the listing of topics or specialisms. To questions about the significance of a quality like 'getting on with people', the usual response is to treat it as an unchanging personal attribute or to assume that it will be acquired on-the-job with no need for any special provision. In special circumstances it might be academicised and included as 'interpersonal skills' or 'psychology'. Thus knowledge is likely to be labelled and packaged according to traditional assumptions about where and how it will be acquired.

By abandoning such assumptions, it is possible for a researcher who studies the professional at work to draw up quite a different kind of map, and hence to put the problems of professional learning in a different perspective. Two examples of such maps are provided as appendices—one for headteachers and one for social workers. Both illuminate important aspects of the mapping problem. First, there is only limited overlap between such practice-derived maps and syllabi for initial training. Not only are large areas of know-how omitted from training, but where there is common knowledge it is structured, labelled and perceived differently. Secondly, where knowledge is outside traditional syllabi, its description is usually rather imprecise. One is reminded of a fifteenth century eurocentric map of the world, in which people and lands beyond the confines of Renaissance culture are barely acknowledged.

A further problem arises from the implicit nature of much professional know-how. Though analyses of such activities as problem-solving, decision-making and communication can be found in books such codified knowledge is clearly different in kind from that experience-derived know-how which professionals intuitively use. The contribution of this particular kind of book knowledge may be increasing in significance as research into these phenomena expands, but it is still likely to remain subsidiary to the acquisition of practical know-how on the job. There is little evidence as yet that leading practitioners possess this book-knowledge, but what comes easily to some may need 'spelling out' for others. The question persists as to how much professional know-how is essentially implicit, and how much is capable with appropriate time and attention of being described and explained.

Oakeshott (1962), following Aristotle, makes a clear distinction between 'technical knowledge' and 'practical knowledge'. Technical knowledge is capable of written codification; but practical knowledge is expressed only in practice and learned only through experience with practice. Some kinds of practical knowledge are uncodifiable in principle. For example, knowledge which is essentially non-verbal—the tone of a voice or musical instrument, the feel of a muscle or a piece of sculpture, the expression on a face—cannot be fully described in writing. Verbal performance, such as teaching or advocacy, which are not fully scripted beyond a brief set of notes, cannot be reduced to

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simple technical descriptions. Even scripted performances, like those of an actor or pianist, take on their special character because interpretations of quality require the repeatable elements such as the memorisation of the script and the reproduction of the sounds to be reduced to instinctive routine.

However, to recognise that uncodifiable practical knowledge exists need not imply that stored written knowledge is irrelevant to such situations. Performances may be written about and discussed by critics and colleagues; and there is a tradition of criticism of non-verbal activities like art and music which, though perhaps overrated, is certainly not futile. The problem lies in the complex, often tenuous, relationship between comment and action. Moreover, as already suggested, the unscripted and intuitive nature of much verbal action makes attempts to describe or criticise it equally difficult. Argyris & Schön (1974) have noted how divergence between comment and action still persists when commentator and actor are the same person. They argue that professional actions are based on implicit 'theories in use' which differ from the 'espoused theories' used to explain them to external audiences or even to the actor himself. Self-knowledge of performance is difficult to acquire, and self-comment tends to be justificatory rather than critical in intent. I shall return later to this problem of implicit theories, but here we should note that Argyris & Schön regard making such theories explicit and thereby open to criticism as the key to professional learning.

This brings us to two interrelated issues which are central to any general analysis of professional knowledge: the role of theory and the generalisability of practical knowledge. Let us begin with propositional knowledge, which comes closest to traditional academic territory, and explore the significance of the following threefold distinction.

(1) Discipline-based theories and concepts, derived from bodies of coherent, systematic knowledge (Wissenschaft).

(2) Generalisations and practical principles in the applied field of professional action.

(3) Specific propositions about particular cases, decisions and actions.

The validity of the first, discipline-based, form of knowledge, does not usually depend on the field of professional action; and the experts who teach it may not even be members of the profession concerned. Consider, for example, the role of psychologists in management education or the role of biochemists in medicine. However, the relevance of such knowledge to professional training is often difficult to decide, especially when crowded syllabi or job pressures force consideration of priorities. It may be easy to argue that an idea connects with a practical situation in the sense of contributing to some understanding of it or to one possible way of construing it; but difficult to persuade a practitioner that it is worth their while to use it. The process of becoming a professional involves learning to handle cases quickly and efficiently, and this may be accomplished by reducing the range of possible ways of thinking about them to manageable proportions. This leads to intuitive reliance on certain communal practitioners' concepts (Buchmann, 1980), while apparently more valid theoretical ideas get consigned to 'storage' and never get retrieved. Another difficulty, which I shall elaborate later, is that theoretical ideas usually cannot be applied 'off-the-shelf': their implications have to be worked out and thought through. The busy professional with an immediate decision to make or a job to finish by the end of the week is unlikely to find time for that. Thus the functional relevance of a piece of theoretical knowledge depends less on its presumed validity than on the ability and willingness of people to use it. This is mainly determined by the individual professional and his work-context, but is also affected by the way in which the knowledge is introduced and linked to his ongoing professional concerns.

The relevance of generalisations and practical principles in the applied field is rarely in doubt, but their validity is more problematic. The effectiveness of most professionals is largely dependent on the knowledge and know-how they bring to each individual case,

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problem or brief. Much of this knowledge comes from experience with previous cases, so its use involves a process of generalisation. Some idea, procedure or action that was used in a previous situation is considered to be applicable to the new one. While most of the previous cases scanned for this purpose are likely to be the professional's own experience, some may be known only through the reporting of other people's experiences (formally in the literature or on courses, or informally via colleagues or social networks). The generalisation used may vary in both scope and explicitness; at minimum Case A is perceived as being like Case K and handled in the same sort of way; at maximum, some practical principle is consciously applied, which is thought to be valid for all cases of a certain type. Semi-conscious patterning of previous experience may also occur, making it difficult for the professional to trace the source of, or even to clearly articulate, the generalisation he is using. It might be argued that one way to develop the knowledge base of a profession would be to study this generalisation process, to make it more explicit so that it can be criticised and refined, and to give close attention to specifying the conditions under which any given practical principle or generalisation was held to apply. Such systematisation of practical knowledge, however, is neither part of a practitioner's role nor a popular academic pursuit; and its feasibility may be open to question.

A useful discussion of this problem of generalisation is provided by Buchler (1961), whose analysis of 'method' includes the following skeletal framework.

> Whoever is said to act methodically (1) chooses a mode of conduct (2) to be directed in a given way (3) to a particular set of circumstances (4) for the attainment of a result. These four simple factors required by the conjunction of 'art' and 'method' can each assume different forms. The mode of conduct adopted may consist in (1a) established practice, in (1b) established practice modified by idiosyncratic technique, or in (1c) essentially idiosyncratic, private practice. Whatever procedure is adopted, it may be utilized (2a) strictly and in accordance with prescription, or (2b) loosely, variably, and with a discretionary relation to prescription, or (2c) uniquely, in consequence of predominant reliance on insight. The circumstances under which the procedure is utilized may be (3a) definitely classifiable circumstances, or (3b) circumstances ranging from the expected and classified down to the minimal circumstances that would allow the procedure. And the result toward which the activity aims may be (4a) an envisaged or familiar type of result, or (4b) an indefinite result accepted as such in terms of desirability, or (4c) a relatively novel result. These forms are not exhaustive, but their possible combinations help to explain the differences that prevail when we speak variously of the art of surgery, the art of writing fiction, the art of management, the art of building, or the art of swimming. [1]

Commenting on Bentham's concept of a 'tactic faculty', Buchler distinguishes between two possible meanings.

> One of these has to do with a prepared order eligible for application to appropriate circumstances; the other has to do with a power of adjusting practice to variable circumstances. The one emphasizes a fund or store of techniques whose function is anticipatory; the other emphasizes resourceful practice precisely in the face of the unanticipated.

According to the model of practice which is believed to be desirable, the process of professional education will need to take a very different form. A combination of (1a), (2a), (3a) and (4a) leads to an emphasis on methodic training, careful analysis and planned activity; while a combination of (1c), (2c), (3b) and (4c) leads to an emphasis on

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variety of experience, responsiveness, invention and quick reading of a situation as it develops. The former can bypass theory by teaching methodic procedures from an apparently atheoretical perspective, the latter is likely to emphasise the primacy of personal experience and lack of time for theoretical deliberation.

Many professions involve a combination of regular routine procedures of Buchler's first type and decision-making situations that more nearly correspond to the second. Proficiency on routine is essential for competence, but it is the handling of non-routine matters which is responsible for excellence. Not surprisingly, the balance of emphasis during professional qualification is frequently in dispute.

Another distinction, related to Buchler's but originating from medicine, is that between well-defined problems and ill-defined problems (Elstein, Schulman & Sprafka, 1978). For a problem to be well-defined, there must be one clearly preferable solution and a small change in the problem results in only small changes in the solution. Where the latter condition still holds but more than one potentially acceptable solution exists the problem is described as 'moderately well-defined'. In either case, there is wide consensus concerning the range of differential diagnoses and treatments and the principles underlying their selection. A formalised approach to teaching this kind of problem-solving is clearly appropriate, and one might expect computer-based simulations to be of considerable value. For ill-defined problems, however, there may be no solution; or there may be more than one solution, with small changes in the problem requiring large changes in the solution. Here the main pitfall is turning to tried and tested treatments without attempting to engage in more appropriate problem-solving strategies.

Returning to our original problem of mapping professional knowledge and know-how, one notable feature is the prominence of non-technical knowledge in practice-based maps as opposed to syllabus-based maps. Communication is perhaps the most widely acknowledged example, so it is worth considering at greater depth. Communication is often treated as a set of 'basic skills' or 'competencies', which are expected to be mastered at sub-degree level. Thus the need for the further development of special qualities in communication is implicitly denied, and its academic status is correspondingly low. However, a map of the communications within a particular profession, which takes into account the full range of communication modes, purposes and contexts, will soon reveal how limited is the extent of what is taught in formal education. There is even a suspicion that some communication capabilities are worsened rather than improved by the process of professionalisation. Much professional communication involves specialised knowledge; and the nature of that knowledge and its mode of organisation constitute the principal difficulty. A science teacher is concerned not only with communication in general but with explaining concepts of particular significance and complexity. The interaction of a solicitor with a client involves not only ascertaining a client's wishes but translating them into legal form, translating the relevant legal knowledge back into everyday language, and confirming the client's choice against other carefully explained options (Cain, 1983).

Communication involves skills which can be improved by practice with feedback, but that is not all. It has to be tuned to person and context. The good communicator draws on 'knowledge of people' and has to be able to 'read situations'. We discuss the latter below, when we come to problems of knowledge use, but let us now consider 'knowledge of people'. This can be both particular, as with knowledge of individual colleagues or long-term clients, and general, as with characteristics of children of various ages, people from certain localities or members of distinctive cultural groups. With this more general 'knowledge of people', the problem is how to learn from experience without resorting to stereotypes. Such knowledge is merely contributing to the more central task of getting to

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know individuals. But how do people acquire the commitment and the ability to get to know individuals? What is the role in such learning of coursework in human relations, psychology or multicultural perspectives in society? What is the effect of different types of first-hand experience with people; or of the process of professional socialisation?

Learning to work in teams and in organisations, is another area where professional education is often found lacking. It also raises problems of when the undeniably positive qualities of 'getting on with people' and 'fulfilling one's role' shade into undesirable attributes such as 'uncritical conformity' and 'value complacency'.

Professional ethics is a particularly difficult area of knowledge to handle. To discuss moral dilemmas arising from casework seems relevant and straightforward, until one recognises that many proposed courses of action conflict with organisational policy or with professional norms. To discuss more strategic value issues about the role of a profession or the way in which it distributes its time and effort is even more threatening. These problems are exacerbated by a number of other factors. One is the implicit nature of many value assumptions: they are embedded in personal habits and professional traditions, and digging them out is difficult, painful and usually unpopular. Second, a particular feature of most professional work is the need for confidence and credibility: the professional has to believe that he is doing right. To challenge somebody's work may undermine their confidence without diverting them from following traditional courses of action. Yet clearly professional traditions have to be challenged on both technical and ethical grounds. Is a common practice still the most effective? Whose interests does a particular policy serve? Usually, technical and ethical questions cannot be wholly separated; but the timing and manner of their asking remains one of the most intractable problems of professional education. Perhaps this is an area where interprofessional groups have something special to offer?

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Modes of Knowledge Use

Behind Oakeshott's distinction between technical and practical knowledge lies an assumption that technical knowledge is used systematically and explicitly while practical knowledge is used idiosyncratically and implicitly. This is true for some kinds of knowledge and some modes of use; but to deny other possibilities is to put unacceptable limits on the symbiotic development of theory and practice. If we create expectations that theory is only used systematically, we direct attention from learning to use it in other ways and encourage its early dismissal as 'irrelevant'. Non-systematic use of theory can be found if we look for it, for example in some of the 'theories in use' identified by Argyris and Schon or implicit in the way some professionals interpret situations. But this kind of use is rarely acknowledged.

Similarly, research into professional practice is beginning to explore the scope for making practical knowledge more explicit, and thus more capable of being disseminated, criticised, codified and developed. The availability of increasingly unobtrusive recording equipment has transformed the nature of reflective self-evaluation and peer group analysis of professional activities. There will always be questions about authenticity when describing the ongoing thinking of the actor—crowded thoughts cannot be fully remembered, the tendency to reconstruct the logic of events after they happen is part of the way our minds work, quite apart from any possible intent to deceive. But such attempts at explicit portrayal of professional reasoning are important for the further development of professional knowledge.

Moreover, the distinction between technical knowledge and practical knowledge becomes virtually impossible to maintain in any linguistic analysis of professional discourse. 'Intelligent' as a technical concept is imported into practical situations where

the term 'bright' is already in common use and the term 'wise' has a subtly different significance. The term 'average' cannot sustain its technical meaning because it has acquired a negative connotation, and because the reference group is rarely given.

These problems stem from trying to classify knowledge by its source alone, by whether it comes from books or from personal experience or even from books describing personal experience. It is equally important, for professional education, to consider the mode and context of use. Mode of use is a rather more difficult concept than context. So let us start with the typology developed by Broudy *et al.* (1964) to describe how knowledge acquired during schooling is used in later life:

Replication
Application
Interpretation
Association

The replicative mode of knowledge use dominates a large proportion of schooling and a significant part of higher education. It is characterised by close similarity between the epistemological context in which the knowledge is acquired and rehearsed and that in which it is used. Typically, the knowledge does not require processing or reorganisation by the user, but gets presented for assessment in a form that differs little from the package received from textbook or teacher. Although memory is now increasingly recognised as a cognitive process and performance is known to be enhanced by reprocessing, the learning task is typically not treated in this way. Practical knowledge also gets used replicatively in routine, repetitive tasks; but it is argued that this is not professional work or that the professional aspect lies in the opportunity the task provides for professional communication with a client, e.g. when nurses and social workers assess clients' needs while performing routine caring or form-filling tasks.

To use knowledge applicatively is to do more than just use it in an applied setting. If a particular 'application' has been coached and rehearsed, then further repetition of it is purely replicative. But where such knowledge is used in circumstances at all different from those previously encountered, more than replication is involved. Application, however, still implies working with rules or procedures, even if occasionally these are of one's own devising. These enable one to translate knowledge into prescriptions for action on particular situations, and it is normal to describe their use as 'right' or 'wrong'. When people refer to technology as 'applied science', they imply that rules or procedures exist for applying scientific knowledge to certain practical situations and that these are clearly 'right'. Sometimes this claim is justified, sometimes it is only an attempt to give high status to a particular branch of technological knowledge.

When a distinction is made between technical or vocational education and professional education, appeal is made to terms like 'understanding' and 'judgement'. By implication, technical/vocational education is confined to the replicative and applicative modes while professional education involves something more. So let us attempt to unravel what is meant by 'understanding' and 'judgement'. Broudy identifies understanding with the interpretative mode of knowledge use. Concepts, theories and intellectual disciplines provide us with ways of construing situations; and our understanding is shaped by the interpretative use of such theoretical knowledge. Perspectives or 'ways of seeing' provide the basis for our understanding of situations and hence the grounds for justifying our actions, but cannot be simply designated as right or wrong.

The problem for professional education is twofold. First, certain systems of thought or paradigms dominate a profession's thinking in such a way that they are passed on unquestioned from one generation to the next. For example, the field of special education was conceptually organised for many years according to medically-derived

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categories of 'handicap'. Historically, this was advantageous in acquiring resources to cater for the needs of children; but it has hindered the development of ways of thinking that are more educationally constructive. Theories within well-established paradigms are found relevant because their concepts and terminology are widely used by practitioners, even though they may not offer any other practical advantage.

The second problem is the converse of the first. To make practical use of concepts and ideas other than those embedded in well-established professional traditions requires intellectual effort and an encouraging work-context. The meaning of a new idea has to be rediscovered in the practical situation, and the implication for action thought through. Yet instead of recognising the significance of this intellectual task, students are led to believe that the use of theory is either simple and obvious or wholly impossible. No model of working with ideas is presented, nor do they find much evidence of it in the busyness of practice.

The interpretative use of knowledge also plays some part in that mysterious quality we call 'professional judgement'. But judgement is not the same as understanding: the brilliant political scientist or commentator does not often make a successful politician. Judgement involves practical wisdom, a sense of purpose, appropriateness and feasibility; and its acquisition depends, among other things, on a wealth of professional experience. But this experience is not used in a replicative or applicative mode; nor is it fully interpreted, for much practical experience accumulates with only limited time for reflection. On the one hand, we expect the wise judge to have had a sufficient range of experience to ensure a balanced perspective, to prevent 'overinterpretation' from the experience of only one or two previous cases of an apparently similar nature. While on the other we expect an intuitive capacity to digest and distil previous experience and to select from it those ideas or procedures that seem fitting or appropriate.

Broudy calls this semi-conscious, intuitive, mode of knowledge use associative and suggests that it often involves metaphors or images. These do not derive only from practical experience but also serve as carriers for theoretical ideas. For example, a group of orthopaedic surgeons who found that they could not make their theoretical knowledge of biomechanical engineering explicit, were shown to use implicit images to carry engineering principles. A ruler, for instance, bends along its flat axis but not along its thin axis; and the image of a ruler allows a surgeon to retain tacit knowledge of the engineering principles involved without having explicit understanding of the exact formulae. [2]

Another profession where imagery is important is schoolteaching (Buchmann, 1980). Progressive education, in particular, has been powerfully presented in terms of images: and accounts of progressive classrooms are notable for their image-making as opposed to analytic qualities. The success of influential educators has been in their capacity to create images that excite and inspire teachers rather than in their prescriptions for classroom practice.

I have used Broudy's typology, not because it is the only one available, but because it opens up the issue of knowledge use for wider consideration; and, I hope, empirical investigation as well. In most professions thinking about the theory-practice relationship is still dominated by the applicative mode of use and one or two dominant interpretative paradigms. This limits both the potential use of theory and our capacity to interpret, refine and improve practice. Moreover the whole process of practical reasoning is almost totally neglected. Is this because we cannot define it, we cannot find room for it, or we cannot decide whether it belongs with the theoretical or practical component of professional preparation? When a group of orthopaedic surgeons were interviewed about their own professional learning, they highlighted a need to observe a number of experts tackling ill-defined problems, each in their own style, and for an additional commentary

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by each expert explaining what he was doing and thinking at the time (Farmer, 1981). Resources of this kind are rarely put at the disposal of professionals in either initial or continuing education.

Contexts of Use

The third dimension of my conceptual framework for studying professional learning concerns the context of knowledge use. Together with an analysis of types of knowledge and modes of use, the careful characterisation of contexts of use allows us to complete a users' map of the knowledge-base of professional practice.

One common assumption is that practical knowledge is context bound, while theoretical knowledge is comparatively context free. But is this true? Let us first consider knowledge of people as an example of practical knowledge, which figures prominently in the appended knowledge maps for headteachers and social workers. Can the acquisition of such knowledge be easily separated from its intended use? We may need knowledge of people in order to decide how to approach them (planning a communication), how to allocate tasks to them (delegation), how to interpret responses from them (understanding a client's concern or brief), how to motivate them (supervising or teaching) or whether to seek their advice (consulting). Ideally, each of these uses would draw upon a different set of encounters with the people concerned; but in practice there is likely to be some overlap. One has met a person only in different contexts from that now being considered, and is faced with the problem of generalisation.

Of course, the idea that one first acquires knowledge of a person and later applies it is itself profoundly misleading. One accumulates knowledge of a person through a series of encounters without necessarily attempting to digest or summarise them. It is only when some action is needed that one rehearses one's memories of these incidents, deliberates upon them and decides what to do. This process of deliberation prior to action (or even inaction) is as much part of one's learning as the original encounters. The encounter probably determines how the knowledge is originally stored, but its later processing is mainly influenced by the context of use. Where notes and records are kept, they may serve as *aides mémoires* as well as summaries, triggering the retrieval of further information from memory.

Our study of how primary schoolteachers make judgements about children revealed precisely this processorial quality (Becher *et al.,* 1981). Information about individual children was stored as memories of little incidents and brief encounters. Although notes appeared to give decontextualised information, talk about them inevitably began by supplying further information to set them in context. Where organised for use, knowledge of children was to guide the teacher's interaction with them and to inform practical classroom decisions about what to assign, how to give feedback, whom to group with whom, etc. The knowledge tended to be provisional and formative, and had to be completely reprocessed for inclusion in more definitive documents like records and reports.

In more bureaucratised professional settings, however, different people may see the client each time. Then there is no personal memory of previous encounters, only the file. Case records become more 'real' than the clients themselves, the need to complete them dominates the encounter and the types of knowledge they demand determine what the interviewer seeks.

Elsewhere I have argued that context of use is equally important when considering the learning of theoretical knowledge. Again, it is customary to talk as if knowledge is first acquired and then subsequently, if circumstances permit, used. But does this match our experience?

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> If somebody encounters a new idea in a lecture, book or seminar and then later refers to it in an essay or project, can we say that the learning takes place only at the moment of the original encounter? Some learning is associated with new input, some with new use; and some, no doubt with the period in between when there may be reflection on input or contemplation of use. Not only does an idea get reinterpreted during use, but it may even need to be used before it can acquire any significant meaning for the user. (Eraut, 1982)

There is much truth in the old adage that you never really understand a topic until you have to teach it.

This view is consistent with my earlier observations that using theoretical ideas in the interpretative mode involves intellectual work, and that such work is strongly influenced by the context of use. Moreover it suggests that using an idea in one context does not enable it to be used in another context without further intellectual effort. For example, the ability of a schoolteacher to use certain ideas about teaching in an academic essay, or even in a school policy document, does not greatly increase the probability of them being used in the classroom.

My analysis of knowledge use by schoolteachers identified three main types of context, each of which is also found in many other professions: an academic context, a policy discussion context and an action context. Let us consider each in turn.

The academic context is characterised by written communication in certain traditional formats: research papers and monographs for faculty, essays, examinations and dissertations, possibly even projects, for students. The demands of these formats determine the general pattern of knowledge use. The possession of knowledge is demonstrated by specialised knowledge and multiple citation of other work. Either standardised accounts of experiments or highly theoretical discussions are expected, perhaps even both. Action has no part to play, for only knowledge confers status. But for students, the demonstration of their knowledge is private and its evaluation non-negotiable.

In policy discussion contexts, however, knowledge use is public, and the validity of knowledge can be a matter of public debate. Knowledge use means more than working out one's own ideas or even writing them down. One has to relate to other people's ideas, to make compromises and coalitions, to persuade people to think again about certain policies and procedures, even to move people to a new view of what they are or should be doing. Then there is a further crucial difference between seeing people persuaded or reconciled to some new policy and seeing that policy implemented at more than a superficial level. Thus one can argue that knowledge use by a team or organisation involves not one but several people coming to understand, accept and internalise new ideas. Just as knowledge use in the academic context requires specialised writing skills, knowledge use in the policy discussion context requires specialised social and political skills.

An important point made by Cronbach *et al.* (1980), when assessing the impact of policy evaluation is that research findings and new ideas affect decision-making indirectly rather than directly, often without acknowledgement. They get used interpretatively rather than applicatively and influence people by changing the nature of discussion about a problem or by introducing new perspectives, not by persuading them that Option A is better than Option B. The language of policy, unlike academic language, has to be vague and general both to be widely applicable and to command consensus or at least general support.

Finally, there are a range of action contexts, which differ widely between professions but nevertheless share a few common characteristics. Unlike the academic, the practising professional is in a 'what ought to be done' environment. The aim is not knowledge but action. Moreover they have to believe in what they are doing, rather than question it,

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because they take responsibility for the consequences. The result is an essentially pragmatic orientation which stresses first hand experience in preference to abstract principles. So there is a certain subjectivism in the approach, a scepticism about 'book learning' and a belief in the individuality of each distinct case.

Friedson's (1971) assessment of the impact of the clinical consulting context on doctors includes the following comments:

> One whose work requires practical application to concrete cases simply cannot maintain the same frame of mind as the scholar or scientist: he cannot suspend action in the absence of incontrovertible evidence or be skeptical of himself, his experience, his work and its fruit. In emergencies he cannot wait for the discoveries of the future. Dealing with individual cases, he cannot rely solely on probabilities or on general concepts or principles: he must also rely on his own senses. By the nature of his work the clinician must assume responsibility for practical action, and in doing so he must rely on his concrete, clinical experience.
>
> Each man builds up his own world of clinical experience and assumes personal, that is, virtually individual, responsibility for the way he manages his cases in that world. The nature of that world is prone to be self-validating and self-confirming, if only because by hypothesizing indeterminacy the role of scientific (that is, generally agreed or shared) knowledge and the role of others' opinions in practice are minimized. This is not to say that such knowledge and opinion are not used, only that thinking in terms of unique individual cases places the burden of proof on the particular rather than on the general.

Jackson (1968) and Lortie (1975) have noted similar qualities in primary schoolteachers, particularly with regard to individualism pragmatism and uncertainty. But other features of the classroom bear less resemblance to the consulting room. The doctor has a little, though not much time to reach a decision as the queue in the waiting-room lengthens. The lawyer preparing a brief has more time, as does the clergyman visiting a bereaved person; though both have to be prepared to meet the unexpected. But the teacher has no time at all to reflect: choices made during the preparation of teaching may be decision-governed, but those made during the course of teaching are largely intuitive. The pressure for action is immediate, and to hesitate is to lose. The whole situation is far less under control. To adapt a metaphor of Marshall McLuhan's, action in the classroom is *hot action,* while action in the consulting room is usually rather cooler.

Where the action is cool, the consideration of new ideas is much more feasible. There will still be pressures of time, but there is less direct interference between deliberation and action. There is more scope for limited trial and experiment. Personal style is less pervasive than in performing occupations like teaching, though still not unimportant. Where the action is hot, however, people have to develop habits and routines in order to cope; and self-awareness is more difficult as there is little opportunity to notice or think about what one is doing. Significant new knowledge about teaching cannot be used without being integrated into a person's overall teaching style, and thereby modifying both the most fundamental and the most intuitive aspects of their practice. The process of experiment, evaluation, adjustment and routinisation takes considerable time; and it is psychologically stressful because it involves deskilling, risk, and information overload when more and more gets treated as problematic while less and less gets taken for granted. Yet professional autonomy/isolation limits collegial support and makes practical help in the action context extremely unlikely. Thus while there may be many attitudinal barriers to integrating new knowledge into cold action, improving hot action raises major practical barriers as well.

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Knowledge Creation and Development

There is a literature on knowledge creation and development but it is organised around assumptions which I cannot wholly support. The principal issues addressed are (1) research policy—what kind of research should be funded and how should such funding be arranged; (2) the impact of research on policy—how can researcher links with policy makers be improved to make research both more useful and more influential; and (3) research utilization—how can the use of research findings be increased by practitioners 'in the field' (Rich, 1981). The principal actors are the research community, whose perspective dominates most of this literature, and the governments upon whose sponsorship they depend. By implication, other professionals are not only excluded from the knowledge creation process but assumed to suffer from knowledge deficiency, either because they ignore research findings or because their work does not fit the expectations or aspirations of government. Though there is now increasing recognition that knowledge may be used interpretatively (Weiss, 1977), knowledge is still defined according to the criteria of the research community alone—as codified, published and public.

A much broader framework is needed for studying the creation of professional knowledge; and the situation looks very different if we move the academic researcher from the centre of the universe. First we notice that new knowledge is created also by professionals in practice, though this is often of a different kind from that created by researchers. Moreover, in some professions nearly all new practice is both invented and developed in the field, with the role of academics being confined to that of dissemination, evaluation and post-hoc construction of theoretical rationales. In others, knowledge is developed by practitioners 'solving' individual cases and problems, contributing to their personal store of experience and possibly that of their colleagues but not being codified, published or widely disseminated. Second, my earlier analysis of professional learning suggests that knowledge use and knowledge creation cannot be easily separated. The interpretative use of an idea in a new context is itself a minor act of knowledge creation, perhaps more original than one of the more derivative types of academic paper. Moreover these two creation processes may not even be distinguishable because new practice rarely get invented from scratch: ideas from the published literature usually have an influence somewhere, even if it is not realised at the time.

Yet another perspective emerges if we look at the influence of practice on research, in particular at how problems for study are selected, defined and interpreted. Some of the possibilities are indicated by Weiss's three models of research use: decision-driven, knowledge-driven and interactive. In the first case research is primarily aimed at informing a particular decision: much commissioned research and evaluation is of this kind, so also is knowledge creation by practitioner problem-solving. Knowledge-driven research, however, aims to contribute to a specific discipline or field of study. It is judged less by utility than by theoretical significance and originality; and it carries the highest status in the academic community. The interactive model is less well defined, because,

> the process is not of linear order from research to decision but a disorderly set of interconnections and back-and-forthness that defies neat diagrams.
> All kinds of people involved in an issue area pool their talents, beliefs, and understandings in an effort to make sense of a problem. (Weiss, 1977)

Such interaction is rare because of the autonomous nature of research institutions and professional communities, but I shall return to this problem in my final section.

Finally we should not underestimate the degree to which unsystematised personal experience affects the knowledge creation process. In talking to educational researchers, for example, I have often noticed how the influences of their own or their family's

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education, or their friends in the teaching profession, or the anecdotes of their students have subtly affected their work. It would not be unreasonable to suggest that the more time researchers spend listening to practitioners, the more their research will attend to practitioners' perspectives and concerns—even without any conscious intention that this should happen. Perhaps we could call this the 'implicit interaction model'.

Having thus broadened our view of the knowledge creation process, let us examine some of the factors which constrain its ability to serve the professions and the public. First, there is the distribution and allocation of resources. Within higher education professions like medicine are well resourced while professions like teaching are not. Banking and insurance are characterised by large firms whose research departments dominate the knowledge creation process. In areas like planning and engineering there is a complex interrelationship between academic and commercial research. The least resources are found where there is no clearly defined commercial sector, e.g. social work, or where there is a preponderance of small practices, e.g. solicitors.

Secondly, the kind of research pursued reflects particular organizational interests. Though academic researchers are freer to choose what to do, they are still heavily influenced by prevailing norms and traditional sources of funding. The varied types of knowledge we reviewed at the beginning of this paper are accorded differential status (Bergendahl, 1984); and some lines of research may never be developed because they are considered to contribute little to the standing of the department or the career prospects of the individual researcher. That research in commercial firms serves particular interests is more obvious, though here also the research may still be of considerable public benefit. The problem is not that existing research effort is harmful or wasteful but that, when seen from the perspective of professional practice, it looks unbalanced and likely to remain so. Some kinds of knowledge are developed while others are neglected; some people's interests are well served while others are not.

Thirdly, the knowledge development potential of practitioners is underexploited. Many of the reasons for this have already been discussed. Much of their knowledge creation is particularistic, transferred from one case to another only by associative or interpretative generalisation. Further reflection and discussion can enhance the knowledge derived from case experience and organise it in ways that encourage its further development. But there is no tradition of engaging in such behaviour in most professional work contexts; and knowledge development receives little attention in an action-oriented environment. Moreover, communication between practitioners is such that only a small proportion of newly created knowledge gets diffused or disseminated. Thus there is no cumulative development of knowledge over time: the wheel is reinvented many times over.

Finally, the intellectual problems of attempting to describe, share and develop practical knowledge so that it becomes more widely available are formidable indeed. This in itself is likely to be offputting to researchers and practitioners alike. Practical knowledge is never tidy, an appropriate language for handling much of it has yet to be developed. Prolonged interaction between researchers and practitioners will probably be necessary, and that is not easy for either to arrange. The researcher/practitioner team will need to combine the analytic skills of the original researcher with the creative skills of the practical problem-solver, the observational skills of the naturalist with the communication skills of the novelist.

Higher Education and the Professions

To conclude this paper I wish to present a case for reconceptualising the relationship

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between higher education and the professions. This case rests largely on arguments already presented, so the outline is brief.

(1) The quality of initial professional education depends to a considerable degree on the quality of practice; and that in turn is influenced by the continuing education of the practitioners. Continuing education needs to be viewed in the broad sense of all kinds of further learning beyond initial qualification, not in the narrow sense of attending courses. Thus it includes informal learning and on-the-job learning.

(2) The improvement of both initial and continuing professional education is dependent on a broader view of what constitutes professional knowledge and know-how, more information about how professionals use and develop such knowledge, and a deeper consideration of how professionals learn.

(3) Neither the creation of new knowledge outside traditional academic territory nor the redevelopment of syllabus knowledge for use in practical contexts are priority concerns among either the academic or the professional community. Responsibility for the development and diffusion of practice-created knowledge appears also to fall between two stools.

(4) The kind of interaction that would be most likely to promote the development and diffusion of practice-created knowledge can be found in isolated examples of collaborative research and mid-career professional education. Thus it is suggested that knowledge creation, knowledge use and continuing education are highly interdependent. Such continuing education could be for the academics as well as the practitioners, feeding both into their research and into their contributions to initial professional education.

(5) The barriers to practice-centred knowledge creation and development identified in the last section, are most likely to be overcome if higher education is prepared to extend its role from that of creator and transmitter of generalisable knowledge to that of *enhancing the knowledge creation capacities of individuals and professional communities.* This would involve recognizing that much knowledge creation takes place outside the higher education system, but is nevertheless limited by the absence of appropriate support structures and the prevailing action-orientation of practical contexts.

(6) Hence higher education institutions and professional communities need to establish closer relations and to assume joint responsibility for knowledge creation, development and dissemination. The foregoing analysis suggests that some of the most fruitful joint ventures might be:

(a) collaborative research projects into the acquisition and development of important areas of professional knowledge and know-how;

(b) problem-oriented seminars for groups of researchers and mid-career professionals, including where relevant members of other professions;

(c) a jointly planned programme of continuing education opportunities for mid-career professionals which assists them (1) to reflect on their experience, make it more explicit through having to share it, interpret it and recognise it as a basis for future learning; and (2) to escape from their experience in the sense of challenging traditional assumptions and acquiring new perspectives. The programme would also provide follow-up support with subsequent 'on-the-job' activities.

(7) Finally it should be noted that throughout this paper we have been primarily concerned with kinds of knowledge, qualities and skills which professionals might legitimately be expected to develop throughout their careers. While the updating of syllabus-type knowledge should not be neglected, I believe it is more likely to follow from rather than lead into a more general emphasis on continuing knowledge creation and development. In few areas of professional knowledge is it appropriate to talk of total mastery or a competence plateau, above which further development of expertise is

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unnecessary. Yet our qualifying system encourages the rigid separation of initial and continuing professional education. More interaction between the two and more explicit discussion of professional development during the post-qualification period would (a) better prepare young professionals for their future problems and obligations and (b) awaken the interest of mid-career professionals in facilitating the 'on-the-job' learning of their younger colleagues.

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NOTES

[1] I am grateful to Harris (1982) for drawing attention to this work.
[2] I am grateful to Prof. James Farmer, University of Illinois for providing me with this example.

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Appendix A

A Map of Headteacher Knowledge and Know-How (adapted from discussion paper for University of Sussex research project (1984))

This can be mapped into three dimensions.

(1) Areas of responsibility—these provide the contexts for knowledge use.
(2) Skills and processes.
(3) Knowledge, which needs to be subdivided to indicate the wide range of knowledge types that are likely to be used.

The following further categorisation is highly provisional, but should serve as a useful base for further enquiry.

(1) *Areas of responsibility*

Curriculum and training
Staff
Pupils
Finance and resources
School organisation
Relations with local environment
Relations with governmental system
Self-management

(2) *Skills and processes*

Collecting information and advice
Giving information and advice
Personal Relations
Handling groups
Written Communication
External relations
Planning
Organising/administering
Co-ordinating and controlling
Political skills
Team building

(3) *Knowledge*

Knowledge of people

External contacts and networks
Sources of advice
Friends in high places/low places
Personal styles/characteristics
Local community

Knowledge of alternatives/trends

Practice in other schools
Decision options
Ways of handling situations
Latest reports
Issues under discussion
Social trends

Knowledge of rules/procedures

LEA systems
Legal knowledge
Budgeting

Interpretive frameworks

Language of education
Social science concepts
Educational research

Appendix B

A Map of Social Workers' Knowledge and Know-How (adapted from Baskett (1983))

(1) Knowledge about resources and how to get them: the existence and worth of resources, what they can do and how they relate to needs, procedures for getting them and how to 'bend' them without 'breaking'.

(2) Knowledge about organisations and sub-cultures, their norms and values and how to deal with them: especially the peer group subculture, community resource systems such as schools and courts, client subcultures and their own administration.

(3) Knowledge of how to get knowledge: personal storage and retrieval systems, using several sources to establish veracity, using personal networks, skills in taking short cuts.

(4) Knowledge of self and how one learns.

(5) Formal knowledge, as found in books articles and higher education courses.

(6) Coping knowledge: practical precepts for coping with the pressures and contradictory demands of the work setting, e.g. "Wait, it will work", "Don't get sucked in", "Tell 'em what they want to hear" and CYA "Cover your ass".

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