Theoretical perspectives of relevance to Networked Learning Communities

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Introduction

This paper tries to give an overview of the various perspectives that might inform the NLC. It does not claim to be definitive nor does it go into too much detail on the various theories, though for some I could provide more information. I start with reflecting on the public information from the NLC, which helped to direct my thinking about what might be relevant, as well as to trail themes and areas, presented later, that link to the various theories and perspectives. I then go on to give the major dimensions or considerations of the theories, in terms of what they are attempting to deal with. Finally I give a more detailed account of each of the theories and perspectives that inform these dimensions.

NLC perspectives

Here I list the references that seem to me to relate to the various theories around or that point up important features of the NLC. (Those with more insight into NLC might add or remove some elements.) These set the scene for the major considerations and the details of the perspectives that follow. I have organised them around

- professional/teacher learning;
- communities;
- knowledge building/creation and sharing;
- teacher research/enquiry;
- other ideas

This is a rough classification to help organise what otherwise would be an uninformative list. I will take each area and quote some of the statements that are in the document *Why Networked Learning Communities?* (NCSL, 2002). Some of the individual statements link across my categories; for example 'creating and sharing knowledge' is linked to 'learning on behalf of each other', but in this section I have ignored these links.

Professional/teacher learning

"teachers….learning from each other" (p. 2)

"professionals….learning together" (p. 2)

"Staff learning and professional development" (p. 6)

"improving own teaching and others'" (p. 7)

"schools … becoming learning organisations" (p. 6)

Communities

This needs to be sub-divided as there are communities that focus on learning and those that are mentioned in more specific contexts. Thus we have: learning communities, those working on problems and those providing support.

Learning communities

"learning …. on behalf of each other" (p. 2)

"learning links" (p. 7)

"collaboration" (p. 3)

"learning partnerships" (p. 6)

"joint learning activities" (p. 3)

Working on problems

"find solutions to common problems" (p. 3)

"working around common problems" (p. ?)

"share problems and practice" (p. ?)

"shape teaching practice …together" (p. 6)

Mutual support

"working in …mutually supportive ways" (p. 2 & 3)

Knowledge building/creation and sharing

"[schools as a] positive force for knowledge sharing and innovation." (p. 2)

"develop and share good practice" (p. 2)

"create and exchange knowledge" (p. 7)

"contributing knowledge and understanding across the whole education system." (p. 6)

"they will create and share more knowledge [working together]" (p. 6)

"pass on their knowledge so that others can adapt it for their own context" (p. 7)

Teacher research/enquiry

"valuing practitioner-enquiry" (p. 6)

"enquiry-based methods to improve classroom practice" (p. 6)

Other ideas

"working within six levels of learning" (p. 5-6) [it is implied that these levels are inter-related]

"leadership for learning" (p. 6)

"professional …. creativity is unleashed" (p. 2)

These statements form major considerations that relate to a number of themes the theories must address, and I deal with these next.

Major considerations for theories

The four themes that are important in the rationale of NLC are encompassed by ideas on: teacher learning, school learning, knowledge creation, and enquiry. Although there are inter-relationships they do have distinctly important elements, considered below.

Teacher learning

It some ways it seems obvious to think of teacher learning in the context of NCL, but actually this is a relatively recent idea in relation to improving teaching and learning in the classroom. Traditionally the talk would have been of *professional development* or earlier ideas of *educational change*, which involved changing teachers' beliefs and attitudes. This talk is depicted well in the idea of a 'normative-re-educative' approach to change (Bennis, Benne and Chin, 1985). The importance of seeing it as teacher learning will become evident in the next section on perspectives, suffice it to say that it implies important changes to individual teachers as well as groups. It is also the case that seeing professional development in terms of teacher learning is increasing in importance (e.g. Wilson & Berne, 1999). In using the idea of 'learning' its proponents don't just want to say something about outcomes (i.e. a teacher learns to do something), but hope to be able to illuminate the process and mechanism of learning so that they can create the conditions for it to take place successfully.

School Learning

The phrase 'learning organisation' is a common one, and of course features in the NLC documentation. Sadly, frequently when it is used little analytic power is provided along with it, and indeed some argue that the concept says little about the process by which an organisation learns, as I will show. For some, it is a concept "whose time has come and gone" (Keep, 2002, p. 5). Without such articulation then creating the conditions to improve learning will be difficult. The issue is whether something can be attributed to the school that enables it to learn as an organisation. This is to give an entity to the school that might be unjustified. This is not to deny collective learning of some kind, but the issue is whether the collective is the staff or whether it is embedded in the organisation of the school (including all its rules, procedures, roles etc.), and this depends upon the theoretical perspective taken. But, whatever the details, something outside individual teacher's learning needs to be accounted for.

There is another tradition that directs attention to the school, namely school improvement (which is linked to school effectiveness, but I will ignore this element). This in some senses builds on the professional development tradition and sees collective action on a number of fronts that lead to the

improvement in the school.[1] This does not usually take a 'learning perspective', but does relate to enquiry, at least in as much as this involves various forms of self-evaluation (mostly at the school rather than the classroom level).

Knowledge creation

This again is a relatively new term, and one that has been linked to 'knowledge management' and 'knowledge transfer'. Its use in education is particularly new and not well developed (Hargreaves, 2001). For some this process lies in organisational mechanisms that allow knowledge to be created and managed, and information systems are seen as part of the solution to this. An alternative approach is to see it in terms of learning, and in this case it may be possible to look at the nature of the knowledge created and the process by which this creation takes place. The issue of transfer (NLC statements talk of 'sharing' in a way that implies 'transfer'; e.g. " pass on their knowledge so that others can adapt it for their own context" [p. 7]) presupposes a 'learning' perspective, though few would see it this way. ('Transfer' is of course a defining term for the various views of learning - more of that later.)

Enquiry

The history of this idea in relation to teacher activity is usually in terms of teacher research, whether that be the Stenhouse (1975) idea of the 'teacher as researcher' or the related 'action research' approach. Both view the teacher as actively taking part in some form of enquiry as part of the improvement of teaching and learning. This has remained an influential line of thinking, finding recent expression in the DfEE's Best Practice Research Scholarships and the TTA's Teacher Research Grant Scheme and other support for such activity (e.g. research consortia set up throughout England). However, it remains an activity for a select group, even in relation to the relatively small proportion of the profession who undergo some kind of professional development (apart from special activities such as the NOF ICT training).

An underlying assumption

Obvious as it may seem, there is an assumption in all of this themes: that engaging teachers in activities that require them to undergo some change will lead to a change in their practice and hence an improvement in student achievement. Therefore in thinking about each of the themes, and the theories that could inform them, it is necessary to look for how the 'activities' (learning at the teacher or the school level, professional development, knowledge creation or enquiry) will lead to a change in practice and hence improvement of student, and do so in a way to maximise both. Obvious though this causal link is between, say, professional development and student achievement, there is little empirical evidence to support it, a point made in the conclusion of review of the literature (Wilson & Berne, 1999).[2]

An underlying strand

It is possible to look at all of the above themes in terms of their link to ideas on learning. Under the teacher learning heading I have already indicated it could be seen to underpin professional development and educational change. Similarly one element of school learning is to view it as a group learning (the staff). But it is also possible to view knowledge creation as a learning process, when it is considered in the same light as, say, constructivist learning. When we use in the context of the individual learner, we think of a learner constructing (creating) knowledge. (There is also a 'social constructivist' approach, which goes beyond individual construction.) The issue, for some, is whether this model applies to teachers as experts, and whether their learning entails this knowledge construction. Some theories are built on this idea (e.g. communities of practice), but others say that this is not sufficient to explain knowledge construction by experts. Both of these perspectives are

[1] Here there is an issue of empirical evidence to justify that improvement takes place and therein lies some of the issues of the link of school improvement and school effectiveness. (See the section *An underlying assumption* and the section on *School improvement*, under *Learning Organisations*.)

[2] Wilson and Berne focused on studies in the USA, those in the UK (e.g. the TLRP Learning how to learn in classrooms, schools and networks) and Australia (e.g. the Australian Council for Educational Research comparative study of 10 professional development strategies and their impact on student achievement) are in progress. Ray Bolam and his colleagues at the University of Bath are also carrying out a study of professional development including a literature review and case studies in schools.

discussed below. Similarly it is possible to see enquiry in terms of learning much as enquiry-based learning is viewed for students (which takes problem solving as central to learning).

All of the above issues and themes will be explored through the perspectives the various theories take.

The perspectives

Some of the themes above provide the focus for a number of the perspectives to be considered, but they are not synonymous. Furthermore, the themes find expression in quite different theories, some of which are in conflict. For example, teacher learning can be looked at through the situated perspective of 'communities of practice', whereas 'learning communities' draws on a tradition stemming from reciprocal teaching and the different roles learners take in the process of learning as a community. At times the various terms (e.g. community of practice and learning community) are used without any underlying conceptual base. I try to explore these bases. Wilson and Berne (1999) lament the lack of an overall theory that will draw together teacher learning, professional development and teacher knowledge, so we should realise that any theories will be tentative and should be used only to shine light on this area, not as theories to be implemented as they stand.

Teacher Learning

General approaches to learning

As indicated above, the central issue to address is whether the focus is on individual or group learning in relation to teachers; i.e. is it an individual teacher or a staff group that we are concerned with (discounting for the moment the school as an organisation). There are two different traditions in relation to this.

- The first considers the teacher as undergoing professional development, and, although there is an individual dimension in this, the focus is often on groups.
- The second reflects theories of learning that apply more generally to students. Putnam and Burko (2000) argued that these theories do indeed apply to teacher learning, and they focused on those that came from one school of theories.

The schools of theories divide on the issue of individual v collective learning. One manifestation of this is the two forms of constructivism indicated earlier: individual or social constructivism. Here is not the place to go into these two perspectives (see: Cobb, 1994; McCormick and Murphy, 2000), but at the core of individual constructivism (sometimes called 'cognitive constructivism) there is a view of mind as an entity that contains and constructs knowledge, and that effectively a person has become expert when her mind reflects that of other experts. Thus we would expect a teacher to try to enable the student to create a concept that she has in her mind in the student's mind. Social constructivism on the other hand has a view of the mind being related to culture and to the social arena, and focuses on, for example, co-construction. In terms of teacher learning, especially in the context of NLC, there is an obvious attraction in thinking about the social constructivist approach. However, as Cobb (1994) argues, we should not see these as exclusive approaches, but two perspectives that give different insights into the learning process.

The situation in theories of learning is not described just by this division, as the 'social perspective' has refinements that have particular implications for the nature of knowledge. The major theory in this social perspective is situated learning (which stems from a view of situated cognition). This theory directs its attention to looking at how learners' understandings are tied to the context and activities that make up their learning activity. Unlike cognitive (constructivist) views, a situated view does not see the mind as learning an abstraction (a concept) that is then applied in any situation (the central notion in some views of transfer). Rather a situated view would see the understanding of the concept as being tied to the context within which it is learned.[3] Thus experts have knowledge that is tied to the situations and activities they deal with. No doubt it is easy to recognise the difficulties that teachers often have with matching their everyday practice to the theories they may be presented by in any 'professional development' activity. (Equally those who teach teachers in such professional

[3] A startling example of this was captured by the Harvard Smithsonian Institute for Astrophysics when they interviewed students before they went into a science lesson on electricity. Prior to the lesson some students could connect up a battery and bulb with wires, but subsequent to the lesson they thought it was not possible because they were not given a 'bulb holder', something they had used in the lesson and they thought was essential for the circuit to work. So, rather than having an abstract notion of a circuit in their head, they had one tied intimately to the context within which they learned it.

development often lament the difficulty they have in applying the theories to practical situations, even when the theories are powerful.) The issue pf the situated nature of knowledge is important in the sharing or transfer of practice from one context to another.

I will take up the two general approaches to teacher learning, first that deriving from the professional development perspective and second the situated learning perspective. I will come back to the individual teacher's learning, when I contrast it with these two perspectives that privilege the collective side of learning.

Professional development perspective

Beliefs

The first thing to note about this perspective is that in general it is one driven by beliefs about the effects of professional development. Thus we know quite a bit about what various studies conclude about 'good practice' in such professional development, but little about the effects on either teachers' classroom practice or student achievement (a point made earlier in the section on *An underlying assumption*). A major recent review of work in this perspective gives an account of the general beliefs about effective professional development, that give guidance on how it should be conducted (Wilson & Berne, 1999):

- ensure collaboration to produce shared understanding, shared investment, thoughtful development and rigorously tested ideas;
- collective participation in training and implementation;
- the focus should be on crucial problems in curriculum and instruction (some say student learning specifically);
- it should be conducted often and long enough to obtain progressive gains;
- it should contribute to professional habits and norms of collegiality;
- there should be opportunities for teachers to see behaviour modelled, obtain practice, feedback, and coaching, and with individual reference as well as group inquiry that is school-based and embedded in work;
- the work should be rooted in a knowledge base for teaching;
- there should be a consistent approach to teaching and learning;
- teachers should be recognised as professionals and as adult learners, with some noting that they should be active learners who construct understanding (a constructivist stance);
- there should be follow-up support;
- development depends on teachers' prior experience, knowledge and beliefs, and needs to take place recognising the context within which they work (some say that it should be situated in their classroom practice);
- teachers should control their own professional development.

These principles are not related to a particular 'theory' of professional development, thought they do consider general ideas of teacher learning, and as such provide useful guidance for any NLC activity. These ideas on teacher learning are not, however, built around theories of learning, although it is evident that constructivist stances are reflected in some principles.

Teachers learning professional knowledge

Wilson and Berne (1999) go on to look at studies that are concerned with teacher learning of professional knowledge, and in so doing concentrate on three areas of knowledge: subject knowledge, knowledge about student learning and knowledge about teaching. Although they recognise theories of teacher knowledge to create these categories (e.g. Schulman 1987), they do not use these to examine the nature of this knowledge (I will do this shortly under *Professional development and teacher knowledge*). They are able to show in some cases empirical connections between the professional development activity, teachers changed classroom behaviour and the subsequent student achievement.

The two studies they examine related to *subject matter* and indicate the importance of teachers being seen as developing their own subject expertise (as scientists or mathematicians) and engaging in subject activity (e.g. scientific investigation). The development activity focusing on the subject should engage teachers' beliefs, allow them to establish shared meanings through discourse and to link this discourse with their practices. One important element in this is the use of teacher stories. They concluded that it takes time to create a community where they can talk about work and that teachers have little experience of engaging in professional discourse that is public and involves critiques of

colleagues' work. The studies related to professional development focusing on *student learning* emphasised the need to allow teachers the chance to be intellectuals, but like the subject matter studies, they had insufficient experience of critical dialogue. They interestingly noted that while the school-based work of teachers translated into school capacity, what was learned outside the school was not easily translated into a school where teacher learning and experimentation were not supported. The studies on teachers working on *teaching* were difficult to distinguish from those on student learning, but they do add some specific elements relating to the use of teacher *networks*.

Professional development networks

Wilson and Berne (1999) review the work of Lieberman and Grolnick (1998), who are the main contributors to the literature on teacher networks.[4] Their work on networks puts forward five organisational themes that are common to networks:

- they should have a *purpose* and *direction* around which groups can coalesce;
- they form growing communities in which individuals have voice and *commitment* to the group (*collaboration*);
- they undertake a *range of activities* to engage participants in learning and discussions (they are a time to 'talk' and developed lasting *relationships*);
- they have *facilitative leadership* to make, contacts, create public spaces to work together, build structures that encourage respectful dialogue, model collaborative stances towards learning and support, enunciate important ideals and leave room for emergent goals;
- *funding* of these groups is a problem.

The networks that formed the basis for these themes were various, from teachers and students linked across schools, to several school districts in a network. The networks also exhibited a number of tensions that had to be negotiated:

- between overall purposes that guide the network and the need to have compelling activities that engage and sustain teachers' membership and participation;
- balancing insider and outsider knowledge (that possessed by teachers and that by outside experts);
- having both centralised and decentralised structures;
- dealing with increased formalisation as the network grows;
- making decisions on who to include and exclude.

However, these themes and tensions are not related to the mechanics of particular configurations or types of networks, but they do nevertheless provide guidance on general principles for networks. Some of the theoretical views that underpin some of the above are found elsewhere. For example, the growth of communities and the way in which structures might be organised is dealt with in Wenger's (1998) communities of practice (see below), and ideas on insider and outsider knowledge are covered by either those who discuss teacher knowledge (e.g. Cochran-Smith and Lytle, 1999; Banks, Leach and Moon, 1999), to which I now turn.

Professional development and teacher knowledge

Cochran-Smith and Lytle (1999) put forward three conceptions for considering the relationship of knowledge and practice: knowledge *for* practice, knowledge *in* practice and knowledge *of* practice. Each of these are underpinned by different images of knowledge, images of teachers, teaching and professional practice and images of teacher learning and teachers' roles in educational change.[5]

Knowledge *for* practice is the traditional relationship of knowledge produced by researchers and academics for use by teachers. Here knowledge is viewed as being valuable when it is formal and grounded in a theoretical or research-based context and underplays the knowledge the professional practitioner brings to bear. It also sees teachers as appliers not as generators of knowledge, and plays

[4] In addition to the summary of their work in Wilson & Berne (1999), Lieberman (1999) has herself summarised this work.

[5] These images of the role of teachers in educational change can be conceived of in terms of the strategies put forward by Bennis, Benne and Chin (1985), one of which was referred to in *Major considerations of theories, Teacher learning*. The other strategies are 'normative-re-educative', which largely underpins the earlier ideas on professional development, and 'power-coercive', effectively the literacy and numeracy strategies.

down that they bringing prior knowledge and have to be active learners, which require linking to new knowledge (again a constructivist stance to teacher learning), leading to the teacher acquiring the new knowledge. The notions of change underlying this view are those where the teacher learns new principles and applies them to practice ('rational-empirical'). In essence this is the position of 'evidence-based practice', where teachers are encouraged to adopt practices that are based on research evidence that gives confidence in those practices.

Knowledge *in* practice is based on a view of knowledge where knowledge is related to action and is not something created separately from the action and then applied to it. In fact this reflects a situated view, which I will deal with shortly. Teachers and teaching are seen as wise action, with reflection on practice being important. This view sees teacher learning and change as them coming to understand their own actions through reflection and inquiry in and on practice, but not necessarily in the research-based way proposed by Stenhouse (1975), noted under the *Enquiry* consideration of major theories.

Cochran-Smith and Lytle (1999) see knowledge *of* practice as the one that has most promise. Although this conception sees knowledge through enquiry they see this as being part of larger political and social agendas. Thus, action research that is directed to increasing the democratic role of teachers, students, administrators, parents and academics in terms of the constructing knowledge collectively is seen as good. In some ways this might reflect the post-modern world of critical stances and tolerating multiple layers and perspectives of meaning. This view of teachers, teaching and professional practice sees teachers as agents, and in that sense is reminiscent of *reconstructionism* as an educational ideology (Skilbeck, 1976).[6] Enquiry leads to empowerment, not just new knowledge. Thus, although they take a strong line on the role of enquiry, they advocate a change in the social, political and intellectual climate to a more activist approach than might be expected by those running the NLC. Nevertheless their analysis of the knowledge-practice relationship and in particular the need to see it in terms of the underlying images, is a useful one. They also indirectly show that often the labels we use (action research, inquiry etc.) have quite different interpretations depending upon the underlying images we have of knowledge, learning and change.

The work of Banks, Leach and Moon (1999) referred to earlier, gives us an alternative view of teacher knowledge from that just discussed. Their model draws on Schulman (1987), who was concerned to explain the transformation that teachers have to carry out to render their subject knowledge into a form that can be learned by students. The model in Figure 1, a development of Banks, Leach and Moon, 1999[7], goes beyond Schulman's ideas, particularly in not seeing knowledge as objective and in trying to take account of the situated nature of knowledge and learning. This representation of teacher knowledge acknowledges teachers' multiple identities: as subject expert (subject knowledge), as subject teacher (school knowledge) as teacher (pedagogical knowledge), and as individual (personal construct). The model also depicts pedagogy in a way that indicates a teacher's knowledge of pedagogy is made up of a series of dimensions that govern their views, decisions and practice in the classroom. The justification and exploration of this model is beyond the scope of this paper, but it indicates the complexity of teacher knowledge and these three aspects of subject, school and pedagogic knowledge.

<Figure 1: a model of teacher knowledge (Banks, Leach and Moon, 1999)>

Such representation enables us to see what the implications are for a teacher when any new activity is introduced into schools. Teachers may have to change their views of the subject, what they count as school knowledge, and how they view (and implement) pedagogy. The element of personal identity in the model is a critical aspect of how teachers react to change that has the potential to be threatening or stimulating. As such it relates to views of change that take the 'normative-re-educative' strategy, to use the earlier theory.

A situated perspective on learning

The discussion so far has been dominated by concerns for knowledge with occasional references being given to *how* teachers are seen to learn, but with only passing reference to the theories upon which they

[6] This is not to be confused with a *social constructivist* view of learning, which although it does concern itself with social and cultural issues, does not have a particular agenda of action that Cochran-Smith and Lytle see in knowledge *of* practice.

[7] I would like to acknowledge the contributions of Jenny Leach and Bob Moon who developed this model.

are based. Any view of learning of course will have an associated view of knowledge,[8] but here the concern is to start with the view of how learning takes place from the situated learning perspective. The roots of this view are numerous, but Lave and Wenger (1991) represent an important, if somewhat difficult, summary of it. Wenger's elaboration of this sets out an elaborate framework for considering such situated learning (Wenger, 1998), which he originally based on his Ph.D. work on insurance claims processors. The perspective on learning that he takes distinguishes learning and doing, not because the latter is mindless and the former thoughtful, but:

> That learning - whatever form it takes - changes who we are by changing our ability to participate, to belong, to negotiate meaning. And this ability is configured socially with respect to practices, communities and economies of meaning where it shapes our identities. (Wenger, 1998, p. 226)

This statement contains a number of ideas and I will return to those on communities later, but initially it is important to notice how it relates to earlier ideas of educational change that involved changing teachers' beliefs and attitudes; the idea of a 'normative-re-educative' approach to change referred to earlier (Bennis, Benne and Chin, 1985). It also links to the literature specifically on teachers that draws on the situated learning (Putnam, and Borko, 2000), where teacher learning is seen from this situated perspective (I will come back to these authors).

In the situated perspective, learning is created through participating in social activity. In this sense there is no individual notion of an idea or concept, but a distributed one. Rather than seeing learning as a process of transfer of knowledge from the knowledgeable to the less knowledgeable, there is instead engagement in culturally authentic activity. Such activity is part of a 'community of practice'. To learn to be a doctor is not just to learn the requisite physiology, anatomy etc., but to enter into the community of practice of doctors. To learn to be a teacher likewise includes not only the various kinds of knowledge shown in three circles of Figure 1, but the core of identity that is a professional teacher. A novice teacher starts on the outside of the community and as understanding increases, moves towards a more central participation in that community of practice, eventually taking part in its transformation; what Lave and Wenger (1991) rather inelegantly termed a movement from 'legitimate peripheral participation' to central participation. Mutual understanding, or 'intersubjectivity' comes through this participation (Rogoff, 1990), and with it is a transformation of identity. A situated approach to learning also brings with it a particular view of how to analyse learning.

Participation can therefore be understood in different ways, depending upon the level of analysis. Rogoff (1995) identifies three inter-related perspectives on learning associated with three planes of analysis. The three planes are 'community', 'interpersonal' and 'personal'; the view of the learning process associated with each of these is *apprenticeship*, *guided participation* and *participatory appropriation*. Lave and Wenger (1991) focus on the community level and hence the idea of the community of practice, with apprentices 'learning the trade'[9]. At the interpersonal level, the process of guided participation focuses attention on the interpersonal activities that are "managed collaboratively by individuals and their social partners" (Rogoff, 1995, p. 146). For both levels the role of the 'expert' is important in the collaboration that takes place, with the learner and the expert involved in joint problem solving. Nevertheless, at the interpersonal level all participants in communal activity are significant. Participatory appropriation is the process "by which individuals transform their understanding of and responsibility for, activities through their own participation" (Rogoff, 1995, p. 150). Rogoff uses this term, rather than the symbol processing idea of 'internalisation'(i.e. the individual construction of knowledge), to emphasise the inter-relationship of the person and the social context. What is central to a situated view of learning is that all three planes of analysis have to be considered in developing understanding of any one plane. As I will show later, this is important in thinking about both individual and groups in teacher learning.

Viewing learning as transformation of identity and enculturation into communities of practice also requires a quite different conception of knowledge to that held by cognitivist or symbol processing views of mind. In symbol processing 'concepts' are objects to be internalised (stored in memory); in situated learning "the activity in which knowledge is developed and deployed is not separable from or ancillary to learning and cognition" (Brown, Collins and Duguid, 1989, p. 32).

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[8] See McCormick and Murphy (2000), for an account of how the two major theories of cognitive constructivism and situated learning view both the process of learning and associated views on the nature of knowledge.

[9] It is important to realise that this is not a craft trade view of apprenticeship, but cognitive apprenticeship (Brown, Collins and Duguid, 1989).

From this view of situated learning comes a central focus on collaboration (between peers and others) and problem solving. Unlike the symbol processing view, problem solving in a situated view is a shared activity even when it is undertaken with an expert; expert and novices jointly solve problems. Problems emerge from activity. Thus they are not given, the assumption in most teaching situations, but experienced. Likewise the solutions to problems emerge from actions in resolving experienced dilemmas. The idea of a dilemma is important: "a problem is a dilemma with which the problem solver is emotionally engaged" (Lave, 1988, p. 175). A dilemma has no unique or stable resolution and there may be no entirely satisfactory solution (Lave, 1988, p. 139). It is these dilemmas that become the *emergent problems* as the activity progresses. Collaboration is at the heart of this situated view, and the development of intersubjectivity. Intersubjectivity between participants arises from the "shared understanding based on a common focus of attention and some shared pre-suppositions that form the ground for communication (Rogoff, 1990, p. 71).

Taking a number of the key features of this theoretical perspective outlined above there are concepts and ideas that can guide teacher learning. Putnam and Borko (2000) use these ideas to show how they can be applied to teacher learning. Their summary of the situated perspective includes ideas on cognition as situated in context and the importance of authentic activities, of participation in discourse communities that provide cognitive tools, and that these require enculturation. They also consider cognition as distributed across tools and people. They interestingly then go on to consider where a teacher's learning should be situated. On the face of it the classroom is the obvious setting, but as different settings will give different ways of knowing it is important to link the setting to the different purposes. Thus to engage teachers in new views of the subject it might be better to have them engage in courses away from school (because in this case they are learning to participate in the subject community, e.g. of scientists). The classroom can constrain change by not encouraging reflection and new ways of working, but to try out and explore new strategies in the classroom requires work in the classroom (with say a mentor). They also explore where the use of cases of practice and vicarious experience through multimedia and various hypertexted environments may situate teachers in the classroom. Finally they draw attention to the need to think in terms of discourse communities of teachers that shape how they think and work. These communities allow discussion of practice, the pooling of knowledge but that, as noted earlier, it is difficult to create a critical discourse where disagreements and differences can be explored constructively. The role of external research-based knowledge is seen to contribute to this approach. Their focus on the social aspects of cognition and hence learning, put together with the general professional development literature, indicate that, although there are strong theories about how teachers learn as a group, much less how they learn as individuals. This balance between individual and social approaches to learning is an ongoing tension in learning theory (as applied to students and students), and applies equally here.

Individual v group learning

Because the literature on professional development and related approaches to teacher learning do not concern themselves with the *process of learning*, they tend to leave out any consideration of teachers as individual learners. They effectively ignore the 'personal' level in Rogoff's (1995) three planes of analysis. There is often a recognition of the individual professional development needs of teachers, as opposed to those for the school or staff as a whole, but no clear concern for individual teacher learning. For example, there is a lack of thought about students and teachers as a community in a classroom, or at least the teacher as an individual learning in a classroom, where of course teachers *practice*. NLC perspectives (e.g. video and student statements in *Why Networked Learning Communities*) show that the networks include students, but this then requires a theory that will integrate either the settings that each learn or the processes of their learning. Most models of learning do not see the 'skilled other' (expert or teacher) as learning something different from the learner, or as engaging in something different (they are just seen as at different levels of expertise).[10] It might be possible to seek a reconciliation through the learner and teacher working on what the learner misunderstands and thus each sees how to improve the learner's understanding. (This would provide a good rationale for a focus on learning to learn for both teacher and student.)

Communities of practice

As indicated earlier, communities of practice as a theoretical approach has developed from a situated view of learning, and one that sees a strong link between thought and action, and hence learning

[10] In the classroom the student is trying to learn to solve mathematics problems etc., whereas the teacher is trying to learn how, for example, a student becomes confused by an idea.

through participating in the activities that make up the practice. Here the basic organising ideas are examined, taken from Wenger (1998).

Communities of practice: the organising concepts

The two central defining concepts are *practice* and *identity*, each of which is seen as a mirror of the other. Through practice we can negotiate meaning, and by negotiating experience we create an identity. Practice can then be seen through five further concepts: meaning, community, learning, boundary and locality. Identity can also be explored in terms parallel to these five concepts, but also in terms of further ideas: identities of participation and non-participation, modes of belonging, identification and negotiability, and learning communities. I will deal with those related to practice but leave those related to identity (I can give more details on this if required).

Practice

I will deal with all five elements: meaning, community, learning, boundary, and locality.

Meaning

This concept sees practice as creating meaning out of everyday experience; meaning does not exist in us, but in the dynamics of interaction (the social aspect). We are affected by and affect the context upon which we act (the link of thinking and action). In negotiating meaning we create new patterns of activity. But this activity is not all doing, i.e. participating, as there is always a reflective element and one which leads to the encapsulating of this in an 'object'. Thus we may participate in assessing student learning as part of the practice of teaching, but we create marking schemes and set procedures to 'capture' this process. These two ideas are included in the concepts of *participation* and *reification*. We can negotiate meaning by participating in activities in our classrooms that relate to a particular kind of new development (e.g. learning how to learn or thinking skills), or through discussions with colleagues, and we can encapsulate the new development activity in a video clip. The theory or principles behind the new development will endow meaning in such clips or instances of practice, and teachers can use them as a focus for negotiating meaning. Reifications can be tools, symbols, stories, terms and concepts that capture practice. On their own, reifications can be abstract and inert.[11] Wenger talks of the duality of meaning in these two concepts, i.e. meaning is distributed between the two: if all we have is participation, with no reification, then little is left to reflection and to uncover assumptions etc.; by the same token too much reification, with no shared experience and interactive negotiation, provides insufficient to generate meaning. These are familiar ideas in the professional development literature of, crudely, anecdotes of practice with no reflection or abstract theories that are not related to practice.

Community

The sense of 'community' comes from defining it in terms of practice, hence the term *community of practice*. Thus, not all communities are communities of practice. Wenger defines three dimensions of practice that give coherence to the community of practice: mutual engagement, joint enterprise and a shared repertoire. *Mutual engagement* implies engagement in some activity, i.e. is not a social category, a network of interpersonal relationships or those in geographical proximity. This gives an interesting view of teachers as a community. They mutual engage in a whole range of activities, not all of which would be regarded as teaching, which contribute to (enable) the community of practice. Attention has to be given to these as much as the teaching activity itself. This mutual engagement does not imply that there are no specialisations and diverse roles in the community. (This is also related to ideas on memberships of more than one community.) *Joint enterprise* is the collective process of negotiation that creates the community of practice, which may not correspond with any organisational (or employer) definition of the enterprise. Of course the practice is shaped by participants, it being their response to the conditions. The community's practice would include the reconciliation of the competing demands on participants from the job, the organisation and their own needs; "makes the job habitable" (Wenger, 1998, p. 46). This also involves negotiating judgements on quality that are shared but not easily reified, leading to a regime of mutual accountability. A *shared repertoire* is built up over time through the joint pursuit of the enterprise creating resources for negotiating meaning. These will be routines, terms, tools and ways of doing things, which will be both reified and participative. Though this repertoire creates meaning through shared points of reference, it does not impose meaning on community members, and hence ambiguity will still exist. We can see in schools the differences in repertoire between a science teacher who has to enable practical work and that of English teacher who

[11] Often in classrooms we teach students such reifications and that is why they may see them as ‘things to do’, with no meaning

has to enable discussions. Whatever else they may share, there are some tools etc., which may distinguish their practice.

Learning

This is the development of the community of practice over time, with it being seen as an emergent structure. Documents and other forms of reification encapsulate the collective memory, but the meaning is re-negotiated when they are encountered through participation. Both participation and reification create continuities and discontinuities that are central to learning. Thus through participation our identity is secured, but change (becoming something new) can be difficult, yet we cannot be transformed without the community of practice. Equally tools etc., can perpetuate practices beyond the conditions that shaped them in the first place. Changes in staff, for example, will cause discontinuities. Practice can be seen as the shared history of learning. Reified practices need to be reinvented, and practice constantly changes, even in apparently routine tasks. The three dimensions of practice (mutual engagement, joint enterprise and shared repertoire) are all subject to learning in practice. Not all change is learning; it must result in a change in our ability to practice, to negotiate meaning. Wenger encapsulates the idea of an emergent structure in the phrase "Learning is the engine of practice, and practice is the history of that learning." (Wenger, 1998, p. 96) Tracing this emergent structure may be some way of understanding how learning takes place in the introduction of a new pedagogic approach or feature of student learning in a school, LEA or even the profession. The most obvious discontinuity, and the one that communities of practice are most know for, is the generational one; *legitimate peripheral participation.* This idea sees learning as newcomers starting on the periphery of participation and then moving into the centre of full participation. (For trainee teachers this is a short process during their training and first appointment: a few weeks observation, few lessons working with an experienced teacher, few weeks on light timetable, then it is full time!) How newcomers are treated is therefore one way of looking at practice as learning. We rarely see the induction of teachers in these terms.

Boundary

All communities have boundaries between themselves and these provide a focus for understanding practice (the notion of legitimate peripheral participation is premised on moving from a boundary of a community). Boundaries define both continuities (connections) and discontinuities, but two forms of connections are of particular importance: boundary objects and brokering. *Boundary objects* co-ordinate perspectives of various constituencies for some purpose. For example: a statement for a child with special educational needs is a boundary object for teachers and educational psychologists (or other LEA staff); the Key Stage 3 results will be a boundary object for headteachers and LEA staff, or Ofsted inspectors; the national curriculum for a subject or phase is a boundary object for many of the communities of practice within (and outwith) education. Such objects (reifications) provide connections between communities of practice that have no specific shared practice, and hence acts as a bridge, but do not necessarily bridge the different perspectives and meanings of the various constituent communities. (We are all aware of different interpretations that are put on such objects listed above by different groups.) *Brokering* occurs when a participant from one community of practice (A) enters another (B) and convinces this latter community to adopt an interpretation of a procedure from the former community (A). This is exactly what we are trying to do when we ask secondary teachers to work with primary teachers to encourage them to use a particular procedure of say, assessment for learning. More probably we ask secondary English teachers to work with science teachers on an assessment procedure the latter already use to encourage the former to develop their practice. It is also possible to use reifications of practice as a form of brokering, which is what we do when we show a primary school exemplar of practice to a group of secondary school teachers. So it is possible to see brokering in terms of participation and reification; the latter 'travel' better, but being uprooted from the practices in which they function reduces impact. There are ways of having participative connections through multi-membership of communities or working with someone from another community in a third community (C).

Locality

This helps to define the extent of a community and to be able to choose the correct level of analysis. A specific interaction does not define a transient community of practice, nor does a whole profession (perhaps even school) define an enduring community. Again it is possible to use the ideas of reification and participation: a whole profession may be too much of a reification (no mutual engagement), whereas a specific activity may not be shared. Wenger gives a long list of indicators of communities of practice formation, but also suggests that the three dimensions of practice (mutual engagement, joint enterprise and shared repertoire) can be used to place a community. It is important to realise that a community of practice is an analytic category and implies nothing about participants'

consciousness of this community; participants may not think in these terms, but this analysis should capture their experience of the world.

To deal with larger units (e.g. schools) it is possible to think of *constellations of practice*. These are inter-connected practices among the separate communities. A school can thus be seen as a constellation of (at least) communities of practice of science teachers, geography teachers, English teachers, etc. This allows a focus on commonalities and distinctions among practices, discourse and styles. Geography (e.g. of the school) can help shared engagement, without conferring shared practices, and proximity can allow learning; learning can also reconfigure relations of geography. (Think of what science teachers can learn from colleagues in their school and from other science teachers in other schools. These considerations will be important for networks.)

This leads to the idea of the *local and the global*, which can be seen in terms of "related levels of participation that coexist and shape each other." (Wenger, 1998, p. 131). It is possible to participate in a global community of practice but not to engage with it. Technology will change this, including electronic conferencing and the like, but there becomes a trade-off of reification and participation. I consider electronic networks next.

Communities of practice and electronic networks

This exploration of the nature of communities has taken place more generally in discussions on electronic networks. Writers routinely refer to electronic networks, as represented by electronic discussion groups, as 'communities of practice' even though they do not imply the theoretical structure reviewed above (see McCormick, 2001). However, there is an increasing literature that does make these links, for example, Bonk & King (1998), who focus on collaboration across electronic networks. Even they do not use the specific communities of practice concepts in their analysis. Two specific studies do employ them: Leach (2002) and Barab *et al* (2001). Leach uses the dimensions of practice that define a community of practice (mutual engagement, joint enterprise and shared repertoire) to describe a community of practice as represented in an electronic network and how teacher development can be analysed in terms of entering into full participation in the community. Barab *et al* (2001) take some of Wenger's dualities (e.g. continuity v discontinuity) to analyse online communities.[12]

Wenger *et al* (2002) refer to these communities as 'distributed' rather than 'virtual' or 'online' to indicate that the electronic environment is rarely the only means by which participation is organised. They consider key issues for these communities:

- Distance: ensuring connections and visibility of participants.
- Size: ensuring that people know each other.
- Affiliation: matching conflicting priorities across the sub-communities and setting clear guidelines on intellectual property rights (especially in competitive situations).

They also lay down four key development activities in designing distributed communities:

- achieving stakeholder alignment;
- creating a structure that promotes both local variations and global connections;
- building a rhythm strong enough to maintain community visibility;
- developing the private space of the community more systematically.

We have, however, an interesting paradox in the use of the idea of communities of practice. Leach (2002), for example, considers participation in the network as the practice at the heart of the community.[13] But that is different from a focus on teaching (or school experience in general) as the community of practice. In the context of a project to develop thinking skills, for example, we could have the practices of developing thinking skills in the classroom that define the communities (or the

[12] Unfortunately they use these dualities only to structure a description of the process they used to construct a web site, and offer little theoretical insight into the use of these dualities (because they had no data to analyse).

[13] So, for example, she considers how newcomers move from legitimate peripheral participation in an electronic conference to a more central participation.

use in science, primary etc., classrooms). Thus, discussion on an electronic conference would be seen in terms of this rather special community (or sub-communities based around subjects and phases).[14]

Activity theory

This area relates to situated learning in that it has a similar set of roots in socio-cultural theory and in the its view of the relationship between thought and action. The theory, as put forward by Engeström (1994), provides a framework of an activity system, which defines a series of triangles relating subject (e.g. a teacher), an object (e.g. promoting student learning through thinking skills) the community (students and teachers in a school), mediating cultural artefacts/instruments (e.g. practices of classroom interaction), rules (e.g. how the school approaches assessment), division of labour (e.g. roles of individuals in the classroom or school), and outcome (e.g. changes in student attainments). This system can be applied at a variety of levels where the subjects and objects etc., change their nature.

While it is evident that this provides some interesting descriptive language to deal with networks (where, for example, it would be interesting to debate what its 'objects' might be), it is not clear how it helps either with the analysis of the situation or any prescriptions that might be useful to those involved in the networks. However, this needs more exploration to determine how it helps. It is certainly general enough for it to cope with the various levels and perhaps the individual v group learning discussed above.

Learning communities

In as much as networks are communities, this idea of a 'learning community' has *prima facia* value. This term is used loosely, much as 'communities of practice' is, i.e. without any theoretical rationale or principles. It is also often used interchangeably with 'communities of practice'.[15] The term has a sound theoretical and empirical base stemming from the work of Brown and Campione (1990). Their work takes a social constructivist approach with ideas of cognitive apprenticeship (Brown, Collins and Duguid, 1989[16]), which also formed some of the ideas of situated learning. Thus it is founded on a view of learning, but this is grounded in work in classrooms where they developed practical strategies for creating the learning communities. Their focus was on the development of higher order thinking in the context of particular content areas (reading was their first area of work), for school-age children.

One important strategy they developed was *reciprocal teaching*, which involves a group of learners and an adult (teacher) with each of the learners taking turns at being a teacher. The rationale is based on a number of elements:

- starting with questioning, then clarifying, summarising and predicting as the basic activities that act as cognitive monitoring;
- joint responsibility for understanding and joint construction of meaning;
- the teacher has a number of roles including modelling expert behaviour, monitoring the group's understanding, diagnosing emerging competence, pushing for deeper understanding, scaffolding weaker learners and fading this support when learners can take charge of their learning.

It is important that the learning focuses on coherent content and that the learning is not a series of unrelated tasks, but building up knowledge in a 'domain'. This reciprocal teaching therefore takes place in an intentional learning environment where the learners control their own learning. But this environment is a collaborative classroom, where there would be 'research groups' for each topic who

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[14] There are a number of studies of electronic networks, including ones from other staff in the Open University, though not all are yet public (e.g. Goodfellow, 2003). Most studies related to education tend to involve teachers on a course in a university setting, albeit that they work at 'a distance', rather than participate in more continuous teacher learning context. Leach, 2002, is an exception; Goodfellow, 2003, also gives examples like this (e.g. TAPPED IN an electronic network in the USA).

[15] This is usually simply a commonsense use of the terms, and not the notion of learning community that Wenger (1998) has in his community of practice ideas. His idea of a learning community deals with the community of practice both as a living context for newcomers to gain access to competence, and to explore new insights and hence knowledge can be created. It views features of identity in terms of how they characterise a learning community. Thus the learning community is creating identity, a sense of belonging.

[16] One of the examples used by Brown, Collins and Duguid (1989) was in fact the reading programmes devised by Brown and Campione.

would develop an understanding of the topic (perhaps by developing materials), the learners would then regroup so that one from each of the 'research groups' taught the others in a 'learning group', giving each person an 'expert' role. This allows the setting up of classroom dialogues where learners acquire and share a common knowledge base, and strive to create causal explanations and deep analogies, with discussion of what counts as evidence and predictions of other possible worlds and the creation of thought experiments. The learners would work on each other's misunderstandings. There are three stages in this method: reciprocal teaching, working on recurrent themes, and generating own learning materials.

This approach to learning communities, as with other 'theoretical' approaches to *learning*, was derived primarily from school learners, and not teachers. However, it is apparent that much of what is proposed would work well for *teacher* learning. The only element that is unclear is the role of the adult (as teacher), because the notion of an expert teacher who will support the rest of the staff is not an easy one, particularly if the staff are trying to work on a new area. Of course it might be that there is an outside expert involved, who could be either a teacher or a university person (depending on your view of professional knowledge!).

Network theories

Actor network theory

There is only one 'network theory' and that is *actor network theory*, originally a sociological analysis combining social theory using post-structuralist approaches and empirical studies of organisations and power and social order. A recent account of the field is given in a collection of papers edited by Law and Hassard (1999), but this contains only one in the area of education. There may well be some productive ideas in this area, but this would need more work to determine the relevant insights.

Knowledge creation

There are theories that are more centrally concerned with knowledge creation, which do not rely on ideas of learning (constructivist ideas are knowledge creation). These theories try to account for how experts develop knowledge. The three sets of theorists that take such a view are: Nonaka and Takeuchi, Engeström, and Bereiter and Scardamalia (Paavola, Lipponen and Hakkarainen, 2002).

Nonaka and Takeuchi

Their work is taken from studying innovations in industry and they have a model of innovation and knowledge creation, which considers how tacit and explicit knowledge relate at different stages and how this moves between different levels (Nonaka and Takeuchi, 1995). They define a knowledge spiral of creation and transformation of knowledge. There are four stages in this spiral:

- *Socialisation* where tacit knowledge is shared at the group level, but remains tacit with shared understandings.
- *Externalisation* occurs when the tacit knowledge is made explicit through the use of metaphors, analogies and concepts that are useful at the group and organisational levels.
- *Combination* of explicit knowledge that can be exchanged.
- *Internalisation* where explicit knowledge at the group or organisational level is internalised into the individual's tacit knowledge.

After this last stage the knowledge spiral starts again.

Engeström

Drawing on activity theory, Engeström uses a theory of *expansive* learning as an alternative and a more extensive model for innovative learning . He uses the idea of a learning cycle with seven stages:

1. individual question and criticise accepted practices;
2. analysis of the situation takes place to find out the causes and inner relations of the activity system in question;
3. modelling of a new solution to the problem;
4. examining the new model by experimenting to see the advantages and limitations;
5. implementing the new model in practical situations;
6. reflecting on and evaluating the process;
7. consolidating new practice.

These do not take place in a fixed sequence. This cycle looks like the usual problem-solving algorithm used to solve all problems.

Bereiter

He is concerned with the knowledge in the world, that is, the conceptual artefacts that make up Popper's World 3 knowledge (Bereiter, 2002). He argues that the conventional views of knowledge in the head cannot account for how knowledge is created, understood and used in collaborative knowledge building. He particularly draws a distinction between learning and knowledge building, and he argues that organisations (businesses etc.) are not primarily about learning, but are concerned to solve problems, originate new thoughts and advance communal knowledge through collaboration. So this takes a more focused view on the process of advancing knowledge.

Learning organisations

Earlier it was indicated that a network of schools had to take the place of the school as a learning organisation seriously. There are two relevant traditions here, ideas on the learning organisation coming from industrial and commercial contexts and school improvement, though I will only focus on the latter.

Ideas from industry

The idea of a 'learning organisation' has been a popular one from the organisational and management literature, and one that might warrant more attention here. However, in a recent paper reflecting on the situation in the UK, Keep (2002) expressed scepticism about whether many organisations had indeed become learning organisations, and whether policy makers see employers strategies of lifelong learning as important (most of the focus being on task-focused training). In education, although the DfES has issued documents on the role of the school in professional development (DfES, 2000), there has been a similar lack of concern with the role or capacity of the school in improving teachers. In addition it seems that the rhetoric of the learning organisation has been stronger than the specific developments and so it might be better to look within education for ideas about such organisations, for example, school self-evaluation and improvement.

School improvement

This area had its roots in the school self-evaluation literature of the 1970s and 1980s (see McCormick and James, 1988), but it has linked up with ideas on school effectiveness (MacBeath and Mortimore, 2001) and taken on the more general ideas on change from the likes of Fullen (1995). The new element is the commitment to improving student achievement, and in a focus on the school's capacity for handling change. MacBeath and Mortimore (2001) argue that schools are becoming more confident, self-critical and skilled at evaluation (particularly in the use of student data). One strand in this literature is the work of MacBeath and his colleagues in the Improving School Effectiveness Project (ISPE) conducted in Scotland, where an ISEP profile of change was developed and used to indicate and provide a stimulus for probing into attitudes and values and to support the development of the school (MacBeath and Stoll, 2001). One feature in this is the idea of a *learning school*, one where staff reflect, adapt and learn, where they will try something new and experiment. Along with this are more common elements from the change literature: ownership of change, shared values, and collaboration. The concern is with the schools capacity to improve; not just a particular staff development to introduce a new teaching strategy, but an internal capacity to engage and sustain the continuous learning of teachers and the schools itself. Stoll *et al* (2001) put forward a model of eight influences on internal capacity, influences that are important to a teacher's capacity to engage in and sustain continuous learning (life and career experience, beliefs, emotional well-being, knowledge, skills and motivation to learn). However, they go on to examine not the individual teacher, but the school-level and external influences on this capacity. Interestingly, in the external influences that are of interest in the context of a network, is the idea of a professional learning infrastructure, i.e. a framework for support: appropriate policy, shared and agreed priorities, time to engage in learning, access to best practices and recent research, and appropriate rewards and incentives.

If the ideas on internal capacity are linked to this external infrastructure, then there is a basis for development of learning. The features in the ISEP change profile and the external professional learning infrastructure are attended to in any network, then there is a basis for network development. However, this still leaves the issue of the individual teacher as learner (something that MacBeath and

Stoll, 2001, p. 177, put at the heart of their model of influences[17]), and here we again have a limit in theories and ideas that have tried to place teacher learning at its heart.

Concluding comments

This last note on the school improvement literature is the concluding comment of this paper. It is a theme that underlies much of the work, namely that there is a lack of connection between ideas of the social learning of teachers and their individual learning. Whatever perspective is taken there is insufficient to guide us in linking the two, whether that be from a learning, professional development or change perspective. This may have important implications for whether we see a network as one of individuals or schools, and the relationships of how the conditions and influence on each provides the context for the development of the network.

[17] This model is helpfully put in a diagrammatic form that would be helpful to a team developing ideas for a network.

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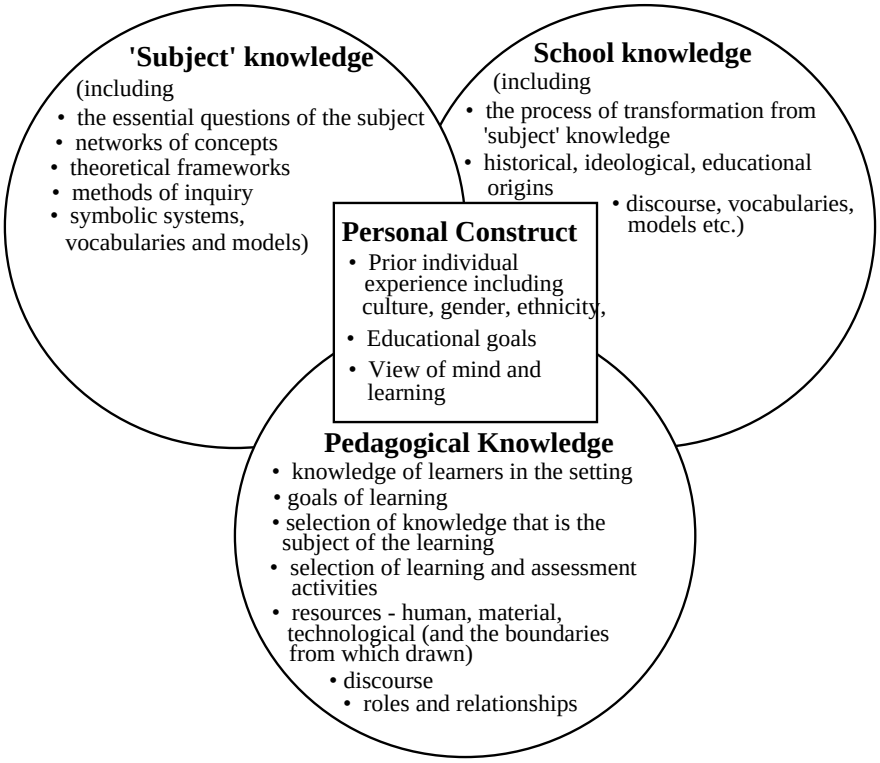

<Figure 1: a model of teacher knowledge (Banks, Leach and Moon, 1999)>