'Finding' and 'revealing' lessons:
Some diagnostic work in teacher education

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'Ethnographies of Diagnostic Work'
Lancaster University, 17/18 April 2007

The paper below presents an analysis from which the 'Ethnographies of Diagnostic Work' conference presentation will draw and represents current work-in-progress. An introduction sets the general scene, data are described, and context for the particular data fragment under consideration is given. The transcript in full can be found on pages 4 to 6. The remainder of the paper sketches an analysis which focuses on the work of finding and revealing lessons for student-teachers.

1. Introduction

Through the use of a short transcript, the paper describes two forms of diagnostic work that teacher educators might routinely engage in and seeks to describe something of it's lived detail. The first form of diagnostic work is found in a specific set of circumstances often encountered by the teacher educator. There can be situations, most especially in the practice situation in which the educator is not *already* in possession of what might be 'taught' and has to *find* this in-and-through the circumstances of the teaching/learning setting itself. For 'lessons' to happen then, they must first be searched for and found, in-and-as-of the routine work of interacting with students in the practicum situation. 'Lessons' are found in-and-through a sort of diagnostic interview in which the teacher educator asks questions to elicit information about the practice experience to be discussed. There would seem to be much here in common with the way a GP or mechanic would begin an initial consultation. The process involves a sort of fact finding enquiry. The purpose is not to naively find facts but to find-facts-in-order-to-examine-them-for-their-potential-as-lessons. The character of the consultation then is that questions first tend to beg information of a general kind. Further questions may then focus on or chase some piece of information and these 'leads' may be pursued or given up depending on what they turn out to be for the professional.

Eventually, the character of questions used changes and they no longer stem from a position of 'lessons still unknown'. Questions have the character of having a 'known answer', and herein lies the second form of diagnostic work that teacher-educators might routinely accomplish. The work turns away from inspecting student responses for possible lessons, to making those lessons happen.

In as much as finding lessons is conducted through the use of questions-with-unknown-answers, making lessons happen (revealing lessons as opposed to telling them) is also conducted through the use of questions, but this time, with questions-with-known-answers. This second form of diagnostic work involves then, the use of questions to form a pedagogy for the installation of a lesson found. The work involves finding the right questions to prompt the responses needed for the lesson to be revealed. It's not always trouble-free.

*To differentiate between the 'where' and 'when', and the 'what' of institutional professional education, the term 'class/classes' is used for the former and 'lesson(s)' for the latter. 'Partner-schools' work with the university to provide practice placements for student-teachers. 'School-based partner-teachers' are those teachers employed by partner-schools who have special responsibility for coordinating the partnership between the school and the university. 'Student-teachers' are also referred to as 'students', but are distinguished from 'pupils' who are the school's students.

2. The Data

The transcript extract is from a seminar between a school-based tutor and a group of eight first-year undergraduate student-teachers. The students are enrolled on a BA/BSc (QTS) Secondary degree. Their main subject specialism is PE and they have elected subsidiary subjects from RE, English, or Geography. The degree has a two-plus-two organisation where students spend most of their first two years studying their subject specialisms alongside regular degree students in those subjects. During these first two years, students take only one professional module in each year. It is in the second two years that students switch substantive focus to professional studies, spending most of their time in the department of education with other student-teachers.

The seminar from which the extract is taken is part of a larger set of recordings from the year 1 professional studies module. Students study part of the curricula of this module in university-based workshops, and some of it in school-based placements. The module consists then of a three hour workshop session on a Monday afternoon, *and* half-day placement spent in a 'partner school' on the Friday of each week over a two semester period. The student cohort is divided into groups of eight to ten and each group are assigned to one of a small number of partner schools for placements. Each of the partner schools has specific staff, usually about three, who deliver the module's curricular in the school setting. They liaise with staff in school to organise activities for the student-teachers to engage in, and they run the debrief seminar at the end of the morning's placement activities. These school-based partner-teachers also liaise with the university, often attend and contribute to university-based workshops, and are involved in assessment moderation and curriculum development.

Students are not then, just dumped in school placements and left to get on with it. There is a concerted effort to connect what happens in university with what happens in school and visa versa. In the extract below, Sue, a school-based partner-teacher is talking with student-teachers at the beginning of a debrief seminar and turns explicitly to such connections:

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Sue  Um equal opps issu::es on Monday at college [university] which we
     will follow up with at school on the Friday and so (hopefully it
     should hold together) in some way.
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Experience in school is seen then, at least by teachers, as directly connected with the taught curriculum in the university setting, and in some ways is the result of an attempt to show students the relationship between theory and practice.

3. Context

During week three of their school placement students are introduced to what might be referred to as 'real teaching' via the topic and practice of lesson planning. John, a PE teacher and one of the school's designated 'partner teachers', introduces the principles of lesson planning and illustrates these through a collaborative process of filling in a lesson plan representing a rugby class that students had just been observing during their morning activities. Students were then asked to plan a rugby class for the following week—a class that would build on the lessons of the current week, and a class that they themselves would teach. The students pair up to do this task (and are asked to finish it during the intervening week) and it is expected that they will teach in the same pairs the following week. Each pair will have a group of eight year 9 school pupils to teach.

When the students come together again in the school setting the following week, they work, as planned, in their pairs with school pupils out on the rugby fields to deliver their planned lessons. John deals with the organisational aspects of the PE class, supervising students as they get changed at the beginning and end of the class, dividing pupils at the start into small groups of eight to be allocated to the different student teacher pairs, and calling pupils and students together at the end of the class to go in. During the class period, the student teachers take responsibility for the teaching/instruction of pupils, and John moves about between the different groups. At the end of the morning the student teachers come together with John for a debrief seminar. The first half of the seminar is given over to reflecting on and evaluating the teaching the students have just done. The second half of the seminar turns to a group effort to plan a rugby lesson for the following week and follows directly on from the reflection/evaluation in the sense of bringing in elements of the earlier discussion.

It is the first half of the seminar that is our focus here. John begins the seminar by asking the

students, in their pairs, to review the lessons they taught and to list three points they'd change if they were to teach the class again (lines 35 to 39 of the transcript). He calls the group together as a whole and begins a 'report back' of the priorities for change. A first group speak about wanting to be more flexible—they found that their pupils were standing around a lot at the beginning of the class and because it had been especially cold, they felt this was not the best start. The point gave rise to discussion about weather conditions in general and the relevance of weather for planning PE classes. The transcript begins as John summaries this first discussion and invites a second pair to report their first priority for change.

A note about the instruction in lesson-planning that students have had is important here for reading the transcript. Students know that each PE class should have a general objective and 'teaching points' for each of four phases of a class. The phases of any class are, in order, 'warm-up', 'recap' of previous skill development, 'skill development' in which new skills are introduced, and finally, a 'game situation' in which pupils have an opportunity to put into practice the skills they've learned.

The lesson that the students will have planned and taught will have involved first, some sort of warm-up activity. After this, pupils will have been reminded in some way of 'rucking and mauling' which were skills introduced and developed during the previous week's class. Student-teachers will then have introduced their pupils to the new skills of 'line-out', before finally, putting their pupils into a small game situation to practice these skills.

4. Transcript

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35   John        On the back of your lesson plans just make some evaluation
36               notes to yourself about what you could (0.5) what you could
37               improve (0.5) on if you taught that lesson again (1.0) All
38               right? So on the back of your notes (.) on your lesson plans
39               sorry (0.5) make those (3.0)
40   Jody        Have you got a pencil down there
41   John        There you go

     ((The audio-recorder is switched off while students discuss and work on
     this task. Recording begins again as John invites student pairs to respond
     by asking what their 'number one' priority for change would be. A
     discussion of weather conditions is initiated by a first pair of students.
     The transcript picks up where John summarises this discussion and invites a
     next pair to report their number one priority for change.))

42   John        // they're going to be looking at that yeah. So you have to
43               think about your positioning when you call them in. You have
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44		to be flexible with regard to the weather and although we
45		said yep you know ninety per cent preparation ten per cent
46		perspiration that – when you go on teaching practice you will
47		always hopefully have wet weather lessons and back up lessons
48		I call them where you can go in to for example the uh gym
49		barefoot because they'll have brought in boots if (.) the
50		weather was really bad (1.0) So that was your number one,
51		being flexible. What about you guys
52	Adam	Um I'd introduce the line-out skills a lot earlier
53	John	A lot earlier so less recap
54	Adam	Yeah less time recapping
55	John	That would be yours. What – what could you do – how could you
56		do that though
57	Simon	Just bring it in gradually
58	Adam	Yeah just keep more of an eye on the time
59	Simon	What I was thinking (0.5) was uh just put a situation where
60		they'll need to use those skills and say you know ok (0.5)
61		((overlapping talk between Simon and Adam))
62	John	In – incorporate the line-out. You see the line-out was
63		definitely the skill development that was a new thing wasn't
64		it but you tended to repeat the practices that we did last
65		time almost from the first stage and I think that we'd moved
66		off the first stage. So how could we incorporate the recap.
67		What sorts of things could we do
68	Sandeep	Introduce them like to the maul ( )
69		I – we introduced them to line-out and they learned quite
70		quickly didn't they=
71	Louise	=um::
72	Sandeep	the line-out and what I did was because we had two groups the
73		boys I had I went 'right once you get the ball turn it set it
74		up and create a maul' and they done that. That's how they got
75		into uh: //
76	John	// But what we're saying that – in – we want to recap cos
77		we're – we obviously you know value the fact that you have to
78		recap each lesson but how can we because of the limited
79		amount of time how can we introduce that how can we get it
80		still as a valuable exercise but not – you almost crunched
81		things up at the end didn't you because you got into that
82		game situation and things were looking quite good weren't
83		they but (0.5) I came along and said 'two minutes' you know
84		so how can we incorporate it (2.0)
85	Jody	(Well I don't really) understand what you mean //
86	Sandeep	// Could you just
87	Jody	because what we did was doing the line-out and from the line-
88		out //

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89    John      // Yeah (.) what we're saying is (.) that (1.0) you wanted to
90              do the recap right
91    Jody      (                         ) of the line-out
92    John      No
93    STs       ((Student teachers talk amongst themselves trying to clarify
94              what is to be 'recapped'))
95    John      Of – of the rucks and mauls of the previous lesson, how can
96              we incorporate that and still maintain time (0.5) Um::
97    Jody      That's it we showed them. That's what we did. We said 'do you
98              remember the ruck d'you remember what we did last week' and
99              most of them said yes. One of them said no so I said 'right
100             I'll stand in you watch for the first time' and he watched
101             and he saw what was happening and he got it
102             (                              )
103   John      So we can demonstrate it and they can they can follow you
104   Sandeep   (If you like) – d'you know like when we're (              )
105             could you just say 'ok um give me some principles of the
106             ruck // or the maul'
107   John      // excellent yeah
108   Sandeep   and then they can come out with
109   John      definitely (1.0) you can talk to them (0.5) in the warm-up.
110             What else could you do in the warm-up
111   Jody      You could do the movements you're about to do
112   John      Well yeah, you – you can make it specific (         ) some
113             of the skills
114   Jody      That was – that was – that was what we did on the warm-up. We
115             took them round and I said 'number one touch the ground (you)
116             pass to the left two touch the ground you pass to the right
117             three you go up for the line-out'
118   John      So you made the warm-up more specific to the recap so you
119             could almost you know in that scenario do something like I
120             don't know relays where they have to do two mauls per (0.5)
121             per run
122   Jody      Yeah
123   John      Yeah? And then they have to do two rucks per run and then
124             they have to do one ruck one maul per run and it's a relay
125             it's fun it's enjoyable it's a disguised way of getting
126             warmed-up it's a disguised way of recapping what they (0.5)
127             had done the previous time ok and all the while you're using
128             that warm-up time to recap rather than have to do a warm-up a
129             recap skill development put it in the game. You haven't got
130             the time.
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5. Analysis

The social distribution of knowledge and professional education

The nature of much adult and professional education is that it's not necessarily or always premised on a 'knowledge in place' in the way that much classroom education of compulsory schooling can be said to be. Classroom lessons at compulsory level have 'what is to be taught/learned' already planned. That is, the 'point' of any specific class is known in advance of it's taking place. It is not that student and teachers come together, talk, and only *then* discover some point to their being together (usually). Lessons are not left to be found (or otherwise) in the situation of the class itself. Students and teacher come together with an expectation that what will take place, will have a pre-planned purpose. Students know that their teachers have lessons in-mind, they know that those lessons are then, in some sense already in-place (see Macbeth, xxxx).

While professional education can proceed along similar lines, it doesn't always, and there are a set of circumstances in which it simply cannot do so. Often a significant aspect of professional education is 'practice'. Different professions have different methods of providing students with opportunities for developing practical competence in the techniques and practices of the profession, but often students are involved in simulations or a practicum. Students spend time 'doing' and at intervals, professional educators make interventions. Interventions can be in the form of instruction, but of interest in this paper are interventions 'after the event' in which professional educator encourages student(s) to reflect, evaluate or analyse their experience in order to learn better about professional practice.

On occasion, intervention is based on an intimate knowledge of the student's experience/practice as when a professional educator 'sits in' on a practice event. On such occasions, interventions can have the character of being targeted. That is, the intervention might be motivated by some element of the observed practice. There are a set of circumstances though where intervention is a scheduled matter but where the professional educator is not in possession of knowledge of students experience/ practice. For example, the students on this foundation professional module often split up to take part in activities in classes teaching their subsidiary subjects. Part of the scheduled activity in the school-based aspect of the module is a debrief seminar at the end of the morning of activity. On occasion, the teacher whose task it is to take this seminar has not been with the students during their morning of activities, and students too, have not been together, and therefore, are also in ignorance of one another's experiences. Nevertheless, teacher and students have the task of 'making something' of their experiences in-and-as-of their debrief seminar. That is, they have to find something, together, that is of relevance to their professional education.

There can be 'degrees of ignorance' in such situations. While it might be that the debrief seminar teacher has no direct knowledge of individual students' experience, they might be in possession of knowledge of what students should have been doing during their school-based activity. That is, students may have been assigned specific tasks such as pupil shadowing or observation tasks. Indeed, tasks may have been designed to connect with an explicitly taught curricula element such as 'equal opportunity' or 'differentiation'. At the other end of the spectrum, the debrief teacher can be, as a consequence of any number of contingencies, in some ignorance of student experience. For example, it can be that a teacher 'stands in at the eleventh hour' due to staff absence. Professional educators, working within such a field of possibilities must then be adept at dealing with more or less ignorance of student experience in their activities of professional education.

Social distribution of knowledge can be a practical problem for professional education

Where a commitment exists to encourage learning through reflection on practice, a practical problem emerges for those who operate within the circumstances outlined above. The professional educator can't simply 'tell' lessons to be learned about practice in an arbitrary fashion. The task is to have students see lessons *about* practice as inherent in their own experience *of* practice. The problem is: How can the professional educator encourage this with limited knowledge of the students experience?

Questions with unknown answers
as solutions to the social distribution of knowledge problem

With the students experience an 'unknown', professional educators must, nevertheless, find ways of proceeding in such a way as to bring lessons into view in non-arbitrary ways; that is, in such a way as to have lessons *appear on cue* (Sacks, xxxx). Some settings constrain the options available for the professional educator; they must find ways of finding lessons in the unknown experiences of their students. Under such conditions, professional educators proceed not on the basis that they have no lessons to teach, but rather, proceed on the assumption that what students have seen or done will yield lessons. The question-with-an-unknown-answer is very often the solution to these situations. By asking knowledge generating questions, professional educators can begin to assemble items that can be inspected/analysed for their potential to point to lessons about professional practice.

Occasionally, a professional educator will have very few resources and will have to adopt a very loose opening gambit. In the example below, Sue finds herself standing in for another teacher. While Sue knows that students have visited subsidiary subject classes for the first time, she knows little else of their experience that morning. Her opening gambit is an attempt to generate, or put in place, some knowledge from which she might then begin to find material for the making of lessons:

```
 1    Sue      It's the first opportunity you've had (0.5) to go into your
 2             subsid area and you've done some observation and some joining in
 3             by the sound of things. Any any initial observations people want
 4             to make (0.5) of a broad nature before we look at the narrow
 5             more narrow focus // impressions
 6             (2.0)
 7    ST 1     No // one
 8    ST 2     // No one wanted to work in uh in the lesson I::
 9    Sue      That's interesting, that's PSE
10    ST 3     PSE. Nobody ever did any work (                              )
11    ST 4     Trying to keep them interested
12    ST 5     Controlling the class
13    Sue      Ok then lets lets go with you. You're saying that it might have
14             been something to do with the nature of the subject (1.0) Yes?
15             Or:
16    Sandeep  No I think it was the::: nature of the::: teacher
17    Sue      Yes
18             ((STs exaggerate sharp intake of breath, laughing))
19    Sue      No well, expand on that
20    Sandeep  Um well basically
21             ((STs joke about professionalism))
22             she knew that um there were two individuals who weren't
23             listening they were like misbehaving and she didn't tell them
24             off
25    Sue      She sort of ignored it
26    Sandeep  Yeah
27    Sue      Why do you think that was?
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Sue's opening question calls for general points. It's a first search for materials. Notable is the pooling of candidate material before, at line 13, she picks one response to follow-up. She does this by formulating what she takes to be the gist (ref) of the comment. If her formulation were correct it would work to set an agenda of sorts (ref). That is, where the 'topic' of the student's comments concerned "the nature of the subject", this would become the topic for further enquiry and discussion. It turns out that the student has an alternative 'reading' in mind and locates the gist of his comments as concerning "the nature of the teacher". Sue must now work to 'find' what it is that the student has experienced that warrants his comments. She again asks an open question in a search for more detail on which she might draw. At lines 17 and 19 she encourages Sandeep to provide more information. In this sequence we see how Sue uses a series of questions with unknown answers together with formulations of what she takes it that the student's comments point to in an attempt to generate material to work with.

We turn now to the transcript presented on pages 4 to 6 to explore this and related issues through the close examination of a single case.

Addressing the problems of a shortage of direct knowledge of student experience

Where Sue had little choice but to begin from 'the beginning' in the sense of having very little knowledge of what the students had been doing, and in order to 'go somewhere' had first to do a lot of work to 'install' some knowledge of what students had seen or done, John is more fortunate. While he hasn't observed each and every student's practice experience for the whole duration of the practice, he has been out on the playing field with them, moving about between student pairs as they taught their lesson plans. In addition, he has supervised these students through a process of lesson-planning. He is in a position to be able to hold students accountable for 'knowing' the stuff on which he has instructed them. John has then, a number of resources to draw on and he does so in order to tackle the problem of not fully knowing what the students will have 'experienced'.

Setting next things to do as a partial solution
to the problem of not knowing what students experienced

John's job is to encourage students to reflect on what they've done and think about it in terms of professional development—what they can learn about teaching and how it could have be done better. He could begin a discussion by asking students generally how they felt their practice went. Rather than start so loosely, he sets the students a task:

```
35    John          On the back of your lesson plans just make some evaluation
36                  notes to yourself about what you could (0.5) what you could
37                  improve (0.5) on if you taught that lesson again (1.0) All
38                  right? So on the back of your notes (.) on your lesson plans
39                  sorry (0.5) make those (3.0)
```

It is a task that makes sense in the context of the work John has been doing with the students. They have learnt about lesson planning and they've just taught the lessons they planned. It now makes sense to think about the effectiveness of the lesson. More especially, by setting the task in an explicit form like this, John is assured that students (a) will have time to think and reflect (not just respond on the spot), (b) have something 'worked out' to say, and (c) will deliver items to the task. By setting the task John limits what can or should properly come next. Though the 'content' of what will come next is not knowable in advance of its delivery, what it *is* will be anticipated and can be oriented to for features that make it what it properly should be, i.e. a feature that could lead to an improved teaching/learning outcome. The point here is that knowing this allows for a more targeted orientation to finding what is 'lessonable' and making it explicit for all. [*point to the 'for all' requirement maybe at the end of the analysis—in the final discussion section]

The analysability of student responses

At line 51, John asks a next student pair to give their priority for change if they were to teach the class again and Adam provides a response at line 52 "I'd introduce the line-out skills a lot earlier." John's utterance at line 53 accepts this and formulates the gist of what Adam means as "so less recap". That is, for John, the upshot or pedagogic consequence of introducing the line-out skills (the skill development) earlier would be to have less recap (of the rucking and mauling skills). Adam agrees. This would, at first, seem to be it; lesson learned so to speak. And we hear the beginning of a closure in the start of John's next utterance at line 55 "That would be yours"; a kind of summary.

```
50    John                               (1.0) So that was your number one,
51              being flexible. What about you guys
52    Adam      Um I'd introduce the line-out skills a lot earlier
53    John      A lot earlier so less recap
54    Adam      Yeah less time recapping
55    John      That would be yours. What – what could you do – how could you
56              do that though
```

But John doesn't close this down. Instead, in-and-as-of-his-closure, he finds a further thing to do with it, and that is to ask how "less recapping" might be achieved. Further, in-and-as-of-finding-the-words-for-this-question, he also finds 'a lesson' not originally seen. [expand and detail the warrant for saying this—refs to CA lit]. It might not be an obvious feature to the students at this point, but John now has an answer-in-mind. He might not have had it at the beginning of formulating the question, but he has it by the end of it.

First attempts to see the lesson-in-mind

Simon (Adam's partner in the paired teaching and in this evaluation activity), makes a first response at line 57 "Just bring it in gradually" to which Adam adds agreement at line 58 "Yeah just keep more of an eye on the time".

```
57    Simon     Just bring it in gradually
58    Adam      Yeah just keep more of an eye on the time
```

A place to demonstrate understanding is in next turn. Adam's agreement in line 68 is such an object. In addition to placing agreement tokens as demonstration of understanding in a next turn, however, a further way of demonstrating understanding is by performing some operation on the prior turn that illustrates the understanding made of it. McHoul & Watson (1984) find that one way school-pupils have for doing this is through substituting new content into an existing knowledge structure:

> Here we might suggest that the most adequate means a student has for displaying her
> understanding of a lesson (or its component part) is to reproduce an item of knowledge which

is *structurally* identical with that most immediately produced by the teacher but with modified content. Thereby, it is the general structure that the student is seen to have mastered. (McHoul & Watson, 1984: 289)

Another way that members achieve this sort of demonstration though, is through formulatin*g* a prior utterance or sequence of talk (ref). Simon rejects Adam's formulation and produces a reformulation, saying in so many words at lines 59 to 61, what he had meant all along:

```
59    Simon        What I was thinking (0.5) was uh just put a situation where
60                 they'll need to use those skills and say you know ok (0.5)
61                 ((overlapping talk between Simon and Adam))
62    John         In - incorporate the line-out. You see the line-out was
63                 definitely the skill development that was a new thing wasn't
64                 it but you tended to repeat the practices that we did last
65                 time almost from the first stage and I think that we'd moved
66                 off the first stage. So how could we incorporate the recap.
67                 What sorts of things could we do
```

An evaluation and a restatement of the question

After some competing talk between Adam and Simon to clarify what they 'meant', John cuts in at line 62 with a formulation of what he takes Simon to be saying: "incorporate the line-out." He is not so much making an evaluative comment *on* the prior utterances so much as evaluating what the *upshot* of the prior utterances amounts to for the business at hand. The formulation is in two parts. First formulating the upshot of Simon's earlier responses; that is, John takes Simon's response as a suggestion to "incorporate the line-out". The second part formulates the line-out in relation to the parts or phases of the lesson: "You see the line-out was definitely the skill development that was the new thing wasn't it…"

John completes his utterance by appending a description of what had happened in the class and a reformulation of his initial question at line 66/67. This time the question provides a location resource for finding an adequate answer that is notably not 'line-out' (the skill development phase), but the prior phase of the lesson; 'recap' (the phase during which skills learned in a previous lesson are 'reminded' through recapitulation).

A (first) resource for finding the 'logic' of John's lesson

We find in John's formulating work at lines 62—67 a first attempt to shift the focus of attention away from the 'line-out' phase and on to the 'recap' phase as a place for 'finding the lesson in mind'. In reformulating his question, via a shift from 'line-out' to 'recap', John brings into view, for those who can see it, a 'logic' for finding and providing an adequate response. The shift is not just any

shift, it is a shift within an ordered structure—the ordered structure of phases of a lesson. And, isn't it in this shift work, that we might say John's 'logic' is first made available or visible. That is, if it weren't seen before, the logic is now discoverable, in-and-as-of the naming of a second member of its class … [expand categorisation analysis here]

An additional point is the 'fixing' of a relevant activity for the answer. That is, John's formulation of Simon's answer as 'incorporation' is retained and employed to set the reformulated question. What John has done in this utterance is to confirm a relevant activity, namely 'incorporate', but to shift the location for its application to an alternative place, or phase, in the structure (logic) of the class. Thus, in retaining the aspect of Simon's response that was of relevance, and shifting the focus of attention via first a formulation of what had happened in the lesson (as it was taught) and a reformulated version of the original question/problem, John *points to* the *what* and *where* of an adequate answer. If it wasn't clear in John's initiating question that he had a 'lesson in mind', with the reformulated question, it must now be clear *to all*.

Moving on and standing still

Sandeep finds in John's reformulated question, an invitation to 'anyone' to provide answers and he does so at line 68. Here Sandeep provides a suggestion followed with an account of what he, and Louise, his partner in these activities, did in the class as they taught it. As soon as it becomes apparent to John at line 75 that the focus of Sandeep's account and suggestion remains the skill development phase of 'line-out', he butts in.

```
68    Sandeep     Introduce them like to the maul (                          )
69                I – we introduced them to line-out and they learned quite
70                quickly didn't they=
71    Louise      =um::
72    Sandeep     the line-out and what I did was because we had two groups the
73                boys I had I went 'right once you get the ball turn it set it
74                up and create a maul' and they done that. That's how they got
75                into uh: //
76    John        // But what we're saying that – in – we want to recap cos
77                we're – we obviously you know value the fact that you have to
78                recap each lesson but how can we because of the limited
79                amount of time how can we introduce that how can we get it
80                still as a valuable exercise but not – you almost crunched
81                things up at the end didn't you because you got into that
82                game situation and things were looking quite good weren't
83                they but (0.5) I came along and said 'two minutes' you know
84                so how can we incorporate it (2.0)
```

When a participant has been invited to talk but what they will say cannot be anticipated by the other, who, nonetheless has an objective to achieve, a 'wait and see' operation can be employed allowing the participant to 'go on talking'. Such an operation allows for relevant topics and issues to emerge, *if* they're going to emerge. A 'wait and see' cannot be allowed to continue ad infinitum though, and that party to the conversation whose responsibility it is to 'move things on', 'get things done' and so forth, will come to find in the talk, sooner or later, whether and what topics and issues are, or aren't relevant. (ref. Digby Aderson). What is John's analysis of Sandeep's response that he butt's in just there and just then? John comes to find nothing in Sandeep's account that will move forward the lesson he has in mind. Indeed, he finds in Sandeep's account, an orientation to the question at hand which is in contrast to the one he has *just* pointed to.

Sandeep explains through lines 68 to 75 how he has taught the 'line-out' skills (the skill development phase) by extending the instruction he (and his partner Louise) have given the pupils in 'mauling' (recap of last lesson's skill development). First he produces a suggestion of 'what could be done', which he extends with an account of what he and Louise actually did in the lesson as they taught it. The "That's how they got into the uh::" at lines 74/75 can be heard, and is heard by John, as a summing up by Sandeep of what he and Louise had done and in hearing the account preceding it, it's conclusion can be anticipated such that what Sandeep has been speaking of is how he and Louise introduced the skill development of 'line-out' by extending their instruction and recapping of 'mauling'. Essentially, Sandeep is speaking of how he and Louise incorporated the recap and the skill development phases of the lesson.

[*The students are clearly oriented to the incorporation of the 'recap' phase, but they are casting forward to incorporate it with the next sequential phase of skill development rather than the prior phase of 'warm-up' which is what John has in mind. Need to review analysis below—probably!].

The "But" of John's 'butting in' at line 76 fixes immediately a contrast in what is to come up in this utterance. In the same way that members orient to preference and can hear a rejection before they hear the content of the rejection (see Macbeth, 2000), so too can members hear, before hearing the content of the contrast, that a contrast will appear. "But" sets up, or announces the character of the upcoming utterance and in it is carried a rejection of the adequacy of Sandeep's response.

Reorienting the focus: A second resource for finding the 'logic' of John's lesson

Hearing in Sandeep's account and summary, an orientation still to the skill development phase of the lesson, John hears that his prior work to shift his students attention to the earlier phase of 'recap' as the site for the work of 'incorporation' has not been successful.

Hearing that Sandeep's account did not contain, and would not contain, the answer he was looking for, has consequences for John then. If he is to make this lesson happen, he must examine the current terrain for where his students appear to be in it, where his lesson is located in it, and whether, if at all, there is a route that he can take that will guide his students to that lesson.

Classroom places such as these are places not only for the assessment of the prior turn for its adequacy or not then, but for assessing the progress of the project (or lesson) at hand. In so many words, such an assessment amounts to the question: Am I moving students forward, backwards, sideways, or in whatever direction I need to move them, sufficiently to have them eventually see the lesson I have in mind? Such an assessment can lead to seeing that students need more information of some kind and this can bring a teacher to reformulate a question or provide additional resources. At times, beginning to provide those additional resources can lead into a full-blown 'telling', dissolving the attempt to bring the lesson into view. These places in classroom lessons are Reece & Walker's (2003) 'thinking on your feet'. They are also Schön's (1987) 'action moments', 'reflection-in-action' and, sometimes, his 'surprises'.

In 'butting in' on Sandeep's summing up, John has heard that Sandeep has failed to grasp the logic of the problem at hand. In butting in he is finding his way, moment by moment, toward a discovery of the consequences of this and to a solution to the consequences this discovery throws up. At line 76 John 'begins' several times, discarding each beginning to take up another, before finding, eventually, a way forward; a solution that doesn't 'tell the lesson' or 'give too much away'. John tries a second time to orient his students to the 'recap' phase of the lesson.

```
76    John        // But what we're saying that – in – we want to recap cos
77                we're – we obviously you know value the fact that you have to
78                recap each lesson but how can we because of the limited
79                amount of time how can we introduce that how can we get it
80                still as a valuable exercise but not – you almost crunched
81                things up at the end didn't you because you got into that
82                game situation and things were looking quite good weren't
83                they but (0.5) I came along and said 'two minutes' you know
84                so how can we incorporate it (2.0)
```

He first formulates the value of the recap phase of lessons at lines 76/77 before introducing the 'problem' of time at line 78/79: "we obviously … but how can we because of the limited amount of time how can we introduce that how can we get it still as a valuable exercise but not …" He continues then at lines 80 to 83 with an account of what actually happened in one group's lesson as they had taught it: "you almost crunched things up at the end didn't you because you got into that

game situation and things were looking quite good weren't they but (0.5) I came along and said two minutes". John completes his utterance with the question at hand: "so how can we incorporate it."

The order in which John brings in elements of this account is significant for how it is to be heard or 'read'. John begins with the value of 'recap' from which he then poses a particular kind of problem – that of fitting in the recap because lessons have a limited time frame (ref. Cuff/Payne, etc). In establishing the value of recap 'up front', before introducing the problem of time, John heads off the potential for students to find the solution as that of dropping the recap phase from the lesson. Thus, in ordering the elements for consideration in this way, John poses a certain order of solution. The solution is not to cut something from the lesson but to 'incorporate the recap'. [Something here that speaks of the strong introduction of 'time' as a feature of the problem being addressed. But the 'logic' that John wants his students to see in relation to time is not the logic of Adam's very early response: "just keep more of an eye on the time". Adam's is a mundane orientation to time – clock time. John wants his students to see how (classroom) time can be mastered by doing two things at once – by incorporating one phase of a lesson with another, achieving both phases simultaneously.]

With both Simon's and Sandeep's failed accounts (of having incorporated the recap and the skill development) on the table, students must now search for an answer to how they can 'incorporate the recap' without reference to 'line-out' and skill development.

Confusion appears

It can be the case that while a teacher is working to make visible and witnessable, a specific logic/ lesson, their students are using an alternative logic/lesson for finding answers to questions posed. In their analysis of a classroom science demonstration, Lynch & Macbeth (1998) show how the teacher orients to the logic of the speed or pace of dispersal of food dye through different temperatures of water; ice, tap, and boiling. But pupils, at least initially, take their task "to be one of producing descriptions of 'what happened' in as many ways as they can, without duplication." (Macbeth, 2000: 49). The two-second gap at line 84 suggests that Jody is not alone in not knowing what John means; there seems to be no competition for the floor here. Despite John's work to make visible the logic of the problem and its solution (the lesson he has in mind), students have failed to find this in his accounts and formulations.

The explanation Jody furnishes for his bafflement at lines 85 and 87 provides John with further resources. Jody, like Sandeep and Simon before him, orients to the 'line-out' as the 'place' for searching for a solution to John's question. Taking up Jody's complaint of not knowing what John means, at line 89 John begins to say, in so many words, what the 'problem' being addressed is: "what

we're saying is that you wanted to do the recap right." Jody's response at line 91 is telling of the confusion announced in his complaint at line 85. Jody's confusion is in the use and meaning of 'recap' which, as his response illustrates, he takes to be concerned with the 'line-out'. There can be many explanations for how Jody has found the 'line-out' to be the 'recap' of John's problem. It does not appear to be because he has taught a different lesson to his fellow students and that in fact 'line-out' skills were recapped before moving on to some other skill development. It seems more likely that Jody has misunderstood how John has been using the term 'recap'.

John's 'logic' is that of the lesson plan with its parsing of lessons as discrete phases with discrete

```
85    Jody        (Well I don't really) understand what you mean //
86    Sandeep     // Could you just
87    Jody        because what we did was doing the line-out and from the line-
88                out //
89    John        // Yeah (.) what we're saying is (.) that (1.0) you wanted to
90                do the recap right
91    Jody        (                         ) of the line-out
92    John        No
93    STs         ((Student teachers talk amongst themselves trying to clarify
94                what is to be 'recapped'))
95    John        Of – of the rucks and mauls of the previous lesson, how can
96                we incorporate that and still maintain time (0.5) Um::
97    Jody        That's it we showed them. That's what we did. We said 'do you
98                remember the ruck d'you remember what we did last week' and
99                most of them said yes. One of them said no so I said 'right
100               I'll stand in you watch for the first time' and he watched
101               and he saw what was happening and he got it
102               (                              )
```

functions. Perhaps Jody finds the sense of 'recap' from within his natural language competence. In this way, anything and everything can be 'recapped' – that is, covered again, reminded, prompted, and so on. Jody hears 'recap' as an ordinary action. John uses 'recap' to refer to a specific phase of the lesson. The disjuncture between the logics of John and Jody are revealed as Jody proposes the 'line-out' as the object for recapping at line 91, and in line 95 as John corrects Jody. John's correction is interesting. He not only produces a name for the object to be recapped: "of the rucks and mauls", but adds "of the previous lesson" which acts as a further definition of what 'recap' *is*. Not only then is *what is being recapped here for our purposes* clarified, but *what is meant by recap on any future occasion* is also publicly defined and made available to all co-present. With this knowledge installed (for everyone), John formulates his question again at lines 95/96: "how can we incorporate that and still maintain time."

Jody produces an account across lines 97—102 in which he describes what he and his partner did to recap the rucks and mauls of the previous lesson. Jody's account achieves the reorientation of focus

called for in John's prior work. However, it only partially orients to the problem posed at the outset of the sequence. While describing how he and his partner had recapped the ruck and maul skills of the previous lesson, Jody's account does not answer how such action could "maintain time".

John formulates Jody's account at line 103, translating it from its detail to a generality: "So we can

```
103   John        So we can demonstrate it and they can they can follow you
104   Sandeep     (If you like) – d'you know like when we're (              )
105               could you just say 'ok um give me some principles of the
106               ruck // or the maul'
107   John        // excellent yeah
108   Sandeep     and then they can come out with
109   John        definitely (1.0) you can talk to them (0.5) in the warm-up.
110               What else could you do in the warm-up
```

demonstrate it and they can follow you." John's formulation does not comment directly on the adequacy of Jody's account, and that his response does not contain an evaluation opens the floor to further offers. That is, by withholding an evaluation, John establishes a bidding situation.*

The break!

Sandeep offers another suggestion at lines 104 to 106 in which he suggests that rucks and mauls could be recapped by asking pupils to say or 'tell' of their principles. While the audio record is impossible to make out and transcribe at this point, it is likely that Sandeep is referring to a particular feature of PE teaching, namely times at which pupils are 'called in' to receive instruction. Unlike classrooms where there is a 'front of class' demarcated by a visible array of furniture and equipment – a platform from which teachers can speak to the class – the playing field has no such facility and 'speaking to the class' must be accomplished in alternative ways to classroom teaching. Teaching on the playing field, with its strong demand for pupils to be in motion, requires teachers to 'call pupils in' to deliver 'teaching points' before pupils return to their activity on the field to put into play the instruction received. These 'call ins' are likely to occur at routine points – their purpose to progress the project of the lesson at hand, to discipline action, to correct, to repair, and so on. 'Call ins' are then often the work of 'moving a lesson on' and are, retrospectively, available on the record as places of transition from one phase of a lesson to another. In order to move a lesson forward from a 'warm-up' activity, pupils could be 'called in' and instructed on next actions. It is this 'place' on the field that Sandeep is likely to be speaking of in his suggestion. The warrant for hearing Sandeep's suggestion as referring to such a 'place' is in John's response at line 109: "definitely (1.0) you can talk to them (0.5) in the warm-up. John's hearing is not just 'in conclusion' to Sandeep's suggestion

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*Something about the mechanisms for this – i.e. how the 'evaluation' effectively 'completes' the sequence. Repeating an answer but withholding an evaluation of adequacy 'sets up' that something more can, and should be, added; that something more could be said, told, described, etc. Mehan, McHoul, etc.

though. John hears in Sandeep's suggestion a solution to his own problem of moving his lesson on and bringing into view the solution to his question of how to incorporate the recap in such a way as to save class time.

Sandeep gets only part way into his suggestion before John cuts in at line 106 with what could look like an evaluation: "excellent yeah". Generally, such terms are used to accept, with praise, a student's correct answer. This is not the case here. John's evaluation is less to do with the adequacy of the content of Sandeep's contribution, and more to do with the usefulness of his contribution for moving forward John's project to bring into view a solution to the problem at hand. As soon as John hears the predicate of Sandeep's suggestion: "ruck", he is able to 'locate' the 'place' in the lesson to which Sandeep's suggestion refers, and, in hearing this, sees a 'next place to go' (ref. Sudnow on improvised conduct) in his project to have students see the lesson he has in mind. That is, on hearing the term "ruck", John anticipates it's second part, locating the phase of the lesson as 'recap', and now hearing in Sandeep's utterance a new location for orienting to it within the lesson structure, namely the 'warm-up'.

Thus on hearing the "ruck" of Sandeep's suggestion John can hear it as locating 'recap' as something that can be dealt with in the warm-up phase of the lesson. Without knowing it, Sandeep has provided John with a resource for moving his project and the lesson on. Without knowing it, Sandeep has opened up the terrain for a further shift of attention in how and where 'recap' can or could, be located. John seizes on the potential contained in Sandeep's suggestion to achieve this shift, asking, at line 110, "What else could you do in the warm-up". It's a break; it's the shift John's been waiting to be able to make and its been 'made possible' in and through Sandeep's contribution – excellent!

The home straight: a correct answer to the lesson-in-mind

John's reformulated question at line 110 proposes a clear location for the solution to the problem of how recap could be incorporated to save time and it receives a prompt response from Jody at line 111: "You could do the movements you're about to do."

```
111   Jody        You could do the movements you're about to do
112   John        Well yeah, you – you can make it specific (          ) some
113               of the skills
114   Jody        That was – that was – that was what we did on the warm-up. We
115               took them round and I said 'number one touch the ground (you)
116               pass to the left two touch the ground you pass to the right
117               three you go up for the line-out'
118   John        So you made the warm-up more specific to the recap so you
119               could almost you know in that scenario do something like I
120               don't know relays where they have to do two mauls per (0.5)
121               per run
```

```
122  Jody        Yeah
123  John        Yeah? And then they have to do two rucks per run and then
124              they have to do one ruck one maul per run and it's a relay
125              it's fun it's enjoyable it's a disguised way of getting
126              warmed-up it's a disguised way of recapping what they (0.5)
127              had done the previous time ok and all the while you're using
128              that warm-up time to recap rather than have to do a warm-up a
129              recap skill development put it in the game. You haven't got
```

John accepts and confirms Jody's answer, reformulating it as "you can make it specific". Jody reveals then that at line 114 that this is indeed what he'd done. [A bit of a damp squib rather than the 'ah-ha' moment this should/could have been?] Jody and his partner had warmed their pupil group up by getting them to do movements that recapitulated the skills learned during the previous week. John summarises the up-shot of the lesson at lines 125 to 130 explicating the benefits of using the warm-up to recap previously learned skills—it's enjoyable and it saves time that would be lost by doing each phase of the class separately.

6. Discussion

Doing diagnostic work in classrooms models the diagnostic work of professional practice

The character of the work undertaken here between John and the student-teachers is rooted in analysis or diagnoses and is overwhelmingly public in that each student has access to the proceedings. The architecture of classroom education is such that not only are lessons revealed to those with the eyes to see them, but the mechanics of it's achievement are also rendered visible (ref. Macbeth's "clockworks"). In searching for, finding, and making his lesson happen, John models for the student-teachers, reflective practice; the art of learning from one's own practice. [*Expand and clarify]

Diagnosis: an adequate description?

The first form of 'diagnostic work' proposed here is the 'finding of lessons'. When teacher-educator and student-teachers come together, their task is to learn lessons about professional practice. A practical problem of a social distribution of knowledge can be an obstacle to this. Teacher-educators use a number of means for overcoming this problem. One means is the use of questions-with-unknown-answers. These are used to generate material that can be and is analysed for it's potential to yield lessons.

Once a lesson has been found through an initial diagnostic search and analysis, questions-with-known-answers are used to design on the spot a pedagogy for revealing the lesson. The on-the-spot, moment-by-moment design of a pedagogy for the installation of the lesson is the second form of diagnostic work proposed here.

What is the benefit of employing the description 'diagnosis' to this work? Won't 'analysis' do? Aren't Schön's descriptive terms of 'reflection-in-action' adequate? Indeed, aren't our ordinary mundane descriptions of say 'thinking on our feet' adequate?

Is there a danger, in adopting for general use, a term very much in specific use (in say medicine and technology), that we might be tempted into a deceit of sorts that ultimately leads us to make analytic mistakes. That is, once applied more generally, we can be tempted to pool together instances of phenomena and treat them alike where, fundamentally, and ordinarily, we would not see them as alike. [*Need to clarify the point I'm trying to make!] On the other hand, there can be obvious positive consequences of identifying a common feature of work settings in the sense of being able to work across disciplinary and subject borders with colleagues working on similar phenomena.

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