Using observation and feedback to develop a SOLE curriculum

Network 3 Curriculum Innovation by Schools and Teachers

Title: Using observation and pupil feedback to develop a SOLEs (Self Organised Learning Environments) curriculum

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In England there has been over 20 years of heavily prescribed curriculum and assessment, backed by a powerful inspection regime which has induced a culture of surveillance and conformity (Edwards & Blake 2007). This has created a particular problem in England with pupil disengagement from school and decline in motivation from about the age of 9 (Sodha & Guglielmi, 2009). Some lower and middle achieving students learn that they are not particularly successful, lose interest and develop low self-esteem. Some high achieving students, having gained much praise and high marks for ‘easy’ work, develop an aversion for challenging work. A ‘high stakes’ assessment culture also has negative effects on motivation (Harlen & Deakin Crick, 2003). Two of the factors which counteract this decline in motivation are choice (Patall et al., 2010) and a curriculum which relates more strongly to students’ interests, questions and experiences (Payton & Williamson, 2009).

In the last four years however, as the limitations of this policy have been realised, schools have been encouraged to develop more creative approaches to the curriculum. For example schools have been able to bid for government money from ‘Creative Partnerships’ (http://www.creative-partnerships.com/projects/) a programme which brings creative workers such as artists, architects and scientists into schools to develop more creative approaches to learning.

Self Organised Learning Environments (SOLEs, Mitra & Dangwal, 2010) is a co-operative learning format in which groups of 3-4 pupils work together to answer challenging questions. The assumption is that all students must be able to answer the questions. The questions can be set by the teacher, especially in the early stages of using the method, or they can be decided upon by the class as they develop confidence and familiarity with the approach. The SOLE method was developed by Sugata Mitra in order to improve the education of children in remote geographical areas in India and has been adapted for schools in England, as an enquiry based teaching approach. Particular developmental work has been undertaken at St Aidan’s School in Gateshead, in NE England.

The Research Centre for Learning and Teaching at Newcastle University is committed to working in partnership with teachers to support knowledge creation through a research informed process. Four university researchers, including Professor Sugata Mitra and Dr Kate Wall from Durham University, have worked with the class teacher, Emma Crawley (EC), in the process of developing SOLE pedagogy and curriculum, both to develop practice within the school and to make it accessible to others (the school has had many visitors and there is a high level of interest). This process follows the tradition championed by Lawrence Stenhouse (1975) characterised as teacher-as-researcher. In this partnership between practitioner and researcher these are both separate and overlapping.
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interests. The four questions addressed in this paper reflect those divisions and commonality, with the teacher most focused on how pupils are responding to the SOLE opportunity and how this changes over time with a concern for how this can help develop her practice. The university researchers are more focused on this as a case study from which to develop a theory that might be used to inform other practitioners. This does not imply that individual questions ‘belong’ to one party or another, but their interest in each is slightly different.

Questions: 1. What are pupils’ perceptions of SOLE learning environments and how do they develop?

2. What did the teacher learn from the raw pupil feedback, observation and video, and how did this influence the development of the SOLE method?

3. What did the researcher’s independent analysis show and did this add anything to the teacher analysis?

4. How can these outcomes best be captured to inform the development of other teachers’ practice?

Methodology/Methods

The teacher’s research diary recorded interesting changes in pupil dispositions and learning behaviours during the school year 2009-10, when she was working with Sugata Mitra. Since autumn 2010 the teacher has been working with a university researcher/teacher collaborating as a critical friend, gathering evidence about the impact on the pupils’ learning and also seeking to refine and improve the SOLE methodology. This is a pragmatist approach to research, in which the pair is seeking to tackle the problem of pupils becoming passive and disengaged and developing materials to support other teachers who want to adopt the approach.

The research has used an action research approach, in which a practitioner, in partnership with a university acting as a critical friend has sought to identify and address practice problems, so that the educational situation is improved. The teacher has kept a research diary, recording both notable events and small incidents. This has been supplemented by regular filming of the class, questionnaires and the use of Pupil View Templates (PVTs, Wall & Higgins, 2006). Particular details of PVTs are given, as they are a very innovative visual research method. PVTs have their origins in educational action research, with the templates aiming to be a ‘pragmatic tool’ (Dewey 1931; Leont'ev 1981) which has meaning and value across both learning and research contexts. In other words, it aims to be a research tool that can be empirically influential and powerful, while also having an impact upon the pedagogical processes within classrooms. The theory behind the tool and its use is fully described in Wall and Higgins (2006); however a brief summary is included below.

The template provides an image of the learning situation on which the research is focused, the process becomes a three-way interaction between the researcher (or teacher), the pupils and the template. The template design has its inspiration in work completed by the Bubble Dialogue team1; for example, McMahon and O'Neill (1992) and also the research of Hanke (2001). The key idea in all these projects is that pupils can be asked, using a cartoon representation, to reflect on their thinking on different aspects of their experience.
The templates aim to gather information on pupils’ attitudes and beliefs about teaching, curriculum content and school/classroom structures (the process of teaching), but also to go further into the realms of metacognition (thinking about the process of learning). This is done through a superimposed structure of speech and thought bubbles. The speech bubble looks at factors external to the individual: the learning of other pupils, teachers and parents and practicalities of learning in the specified context (cognition in general). In contrast, the thought bubble is intended to look at the ‘internal’ processes: the learning of the individual - ‘what is going on inside their head’ (metacognition). An overlap between the two fields is expected with regard to advantages and disadvantages and subject differences: the impacts on the learning of themselves and others.

The speech bubble and the thought bubble on the template means that there is an automatic prompt for the pupil to talk about what they are thinking. This could very simply be what they think about a specific activity, for example independent reading, or it could be more sophisticated with regard to the more abstract thinking processes which they associate with or utilise during a specific activity. The latter abstraction into metacognitive process can be seen to link with Veenman and Spaans’ (2005) concepts of metacognitive knowledge and metacognitive skilfulness.

In total 122 pupil views templates were analysed. They were administered on 8 different occasions throughout the academic year using prompts that reflected different aspects of the SOLE process. All of the words written by the students were coded using using Moseley et al.’s (2005) model. The words were categorised as to whether they were predominantly evidence of cognitive skills: information gathering, building understanding, or productive thinking; and/or whether they were evidence of strategic and reflective thinking. The following definitions based on the model were used:

- **Information gathering**: Comments in this category tended to be characterised by recall of ideas and processes, comprehension of information they have been told or have read;
- **Building understanding**: This needed the concepts of information gathering, but also required some organisation to be given to these ideas and recollections, some idea of relationships were looked for, plus some development of meaning about implications and patterns that could be applied.
- **Productive thinking**: These comments tended to show reasoning, problem solving and some movement of understanding beyond the concrete and towards the abstract. Ideas that were generalisable and creative were placed in this category
- **Strategic and reflective thinking**: This category looked at whether the comments represented an awareness of the process of learning. It needed a reflective or strategic element to the statement; that this comment represented thinking about learning.

They all those labelled as strategic and reflective, and therefore indicative of metacognition, were then re-analysed for evidence of metacognitive knowledge and metacognitive skilfulness (Veenman et al. 2005). These categories were characterised in the following ways:

- **Metacognitive knowledge**: Comments in this category demonstrated an understanding that the child could think about learning, and that the individual understood some of the processes which supported their own learning.
- **Metacognitive skilfulness**: Comments within this category represented a movement beyond knowledge towards the application and translation of thinking and learning skills across different contexts or for different purposes.
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This coding system has been checked for inter-rater reliability with an agreement of 82% which was felt to be very good for qualitative data. It should be noted in all the graphs that the categories used were not necessarily mutually exclusive and a single text unit could be classified as fitting under more than one category. In addition, in the following analysis findings are based on the percentage of templates completed with a text unit coded in the respective categories. In that each template is likely to include more than one text unit and therefore more than one coding, percentages in the following figures do not add up to 100%.

The data collection also included a simple questionnaire for pupils to enable them to compare ‘normal’ and SOLE lessons (see Fig. 1.), a mind mapping exercise with similar aims and some stimulated recall interviews using the PVTS

Figure 1. Simple questionnaire for pupil comparison of SOLE and ‘normal lesson’

Findings

Q1. What are pupils’ perceptions of SOLE learning environments and how do they develop?

Pupils are generally positive about the SOLES pedagogy. Fig. 2 shows their responses to the questionnaire. Their response cannot be interpreted as just enjoying something new as the approach was a regular feature of their work across the whole year. They report remembering more, working with others, having more choice and being more excited in relation to SOLES.
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Figure 2. Student comparisons of SOLE and normal lessons from questionnaire data

Fig. 3 shows the results of their response to a mind map where they could reflect their opinions on the two forms of organising learning. The responses have been classified into 7 simple categories. The pupils generally enjoy school, so there are many positive comments about both approaches but they are slightly more explicit about learning processes in SOLES, which might be because it is the approach that is seen as different. The big difference however is in the large number of negative comments made about ‘normal’ lessons against the much smaller number for SOLES.

Figure 3. Student response to a mind map comparing SOLE and ‘normal’ lessons
Finally the analysis of the PVTs does not show any clear pattern in the incidence of any of the cognitive categories, so it is not evident that pupils are becoming more metacognitive over the course of the 5 months covered by the use of the templates. It is strange that the second ‘stand up and present’ (24.1.11) PVT generated more response than other occasions, both generally and in relation to productive thinking (problem solving/more abstract) and metacognitive knowledge and skilfulness. It is conceivable that this is because this occasion of presenting to the rest of the class was the cause of more anxiety and challenge, which needed some effortful cognitive work, but it is then hard to explain why the similar presentation event (15.12.10) did not have anything like the same effect. It is possible that the administration of the PVTS varied over time and also that the different reflection foci induced genuinely different responses. Although it cannot be attributed only to the SOLE work there is repeated evidence within the PVTs that pupils are developing sensitivity to their work habits and the accuracy of their work:

(Related to working together with laptops) I have learned who is sensible to work with and not to be silly with my friends)

(Related to doing a presentation being given by a peer) That’s totally wrong. They are all false facts. What if I say it wrong. I want to get lost.

There is certainly scope in practice development in the whole class plenaries to give prominence to reflection into the cognitive, affective and inter-personal processes and resources used by pupils.

Figure 3. Number of words in 8 PVTs related to cognitive and metacognitive categories.
Q.2. What did the teacher learn from the raw pupil feedback, observation and video, and how did this influence the development of the SOLE method?

There are three very evident themes in the teacher’s response to the ongoing (fairly natural) observation of and feedback from pupils – the explicit framing of the question for enquiry, the operation of the ‘policeman’ and the importance of whole class plenary sessions, when learning is discussed and reflected upon. However these three themes are underpinned by a further issue, which is experience and confidence in the SOLE methodology developed over time:

*The previous year of working with Sugata was really helpful – I felt more confident about thinking about what was going on rather than making sure the class were organising themselves and behaving.*

On the first theme of SOLE questions, EC soon appreciated that subtle changes in the framing of the question could make a significant difference to processes, and that the context of the topic influences the scope of the question:

*It depends on the intent of the question – if it’s a longer topic, you might need to spend more time introducing the question, whereas if they have a lot of prior knowledge you can spend less time.*

In relation to the ‘policeman’, the starting point for considering this is EC’s desire to give pupils the greatest degree of responsibility possible. She learned quickly who might operate well in that role and how to compensate when the individual was less of a ‘natural’:

*If you’ve got a police officer that people might not listen to then you might structure a chat at the beginning to talk about ‘how to be a good policeman.’*

EC was also keen to encourage *distributed cognition* by making available the best ideas and arguments to the rest of the class, so she made notes:

*The note taking was really important. If you observe something that you haven’t seen before, or if you overhear something that a child has said then you might reflect that back to the class during the review.*

*I might think ‘this time I just need to spend more time reflecting at the end’.*

As well as these specific developments of practice there was a more global effect of using SOLEs on EC’s teaching, which reflects progression in her approach to supporting learning, as there is a ‘knock-on’ effect into her wider thinking and practice, reinforced by the pupils:

*Whatever I do now, I think, would a SOLE question be useful here or not? I don’t do it for the sake of it, I think ‘would it be valuable?’ ... The SOLE method bleeds into everything else I do. The students start to take SOLE experiences into other lessons too – they ask ‘why can’t we work in groups of 4 in this lesson?’ sometimes I think, well, actually OK you can, whereas sometimes I have to explain it’s just not appropriate.*

The partnership between the HE researchers and EC has been closer than anticipated (a good thing) therefore the data collected by PD has readily made its way back to EC. Generally speaking, the
SOLE has provided the opportunity to EC to stand back, observe and reflect on her practice. It must be stated that this is influenced by her constructs related to teaching which give priority to pupil responsibility, curiosity and autonomy. What she often sees therefore is how and to what degree they utilise the opportunity to have more choice and freedom. She interprets this very much as them being more natural and true to their natures, which allows her to get to know them better as individuals and as learners, away from the constraints of learning (assessment) targets. This immediately has some implications for practice in terms of how much structure is required. The reflections below represent her response to what she was seeing in the classroom.

- I was able to see how the students would choose to learn without any input from me. It’s more representative of what they’re like. You feel like you know them a little bit better. They’re more themselves, there’s less pressure on them to perform, to do what they think I want them to do.
- It makes you think about how to operate in other lessons, like if you need to be ‘on the case’ all the time. It makes you think about why you teach in a certain style.
- It raises your expectations of what they’re able to do without your help. You can relinquish more control.
- It makes you reflect on your practice. You think about how you present non-SOLE lessons, how much time you give them to talk, how much time you give them to follow their own learning, how much structure is necessary.

3. What did the researcher’s independent analysis show and did this add anything to the teacher analysis?

There are some subtle differences in her response to the data collected by PD (e.g. via PVTs). This gave her a more detailed and nuanced appreciation of the pupils’ experience. The research process here has been valuable in both reinforcing perceptions and adding justification, as there is validation that the response she ‘sees’ is borne out by the PVTs and other data.

The formal data showed me what the children actually thought about it. It’s their point of view. It confirmed/dispelled ideas that I was having throughout the process. Sometimes it’s really surprising to see what they write. I was amazed at how brutally honest they are – as soon as you say ‘it’s not a test, you can write what you want’ they really do! It confirms what you think you’re seeing, what you think your changing, is real, because the children see the benefits of working in this way as well. It’s quite important with this kind of thing, that you know the children are enjoying it and benefiting from it.

On PVTs – I don’t think it changed my relationship with the students, I think it made me more aware of their views on all the aspects of the SOLE process. You don’t really realise how many decisions are going on in their heads at the different stages of an enquiry.

As indicated earlier there was a closer working partnership between EC and PD than anticipated. However the HE researchers conducted a separate analysis of EC’s journal to explore patterns. The journal contains reflections based both on her presence in the room and to a lesser extent watching video of sessions and discussion with university colleagues or visitors. For rapid analysis the 20
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entries have been divided into four time periods, each covering five entries. The first period covers approximately the first half term from September until mid October. The second runs till November. The third starts in early December and goes on till early January and the last runs from mid January through to April 2011. From Fig. 5 it can be seen that there is considerable early emphasis on general behaviour and the functioning of the ‘policeman’ with some consideration of the SOLE process and the quality of information being found and analysed. Generally speaking, the outcome of observations on behaviour lead to the writing of questions that may prompt children to reflect on their behaviour. In entries 6-10, the focus on behaviour lessens and there is more consideration of how pupils are responding. This continues into the third period when the focus on pupil response and learning gathers pace along with reflections on planning which in many cases are prompted by observations on individual pupil progress or more general issues about learning. One of the most significant challenges is learning how to conduct plenaries in which groups present. The teacher, EC, saw this as a significant opportunity to deepen and broaden learning and to challenge pupils. Thinking about planning includes short terms planning on how to proceed next lesson and longer term planning. The focus on pupil response/learning is the dominant category, although there are more general reflections on the year so far. Another emerging category is observations on how groups are working together, perhaps in terms of accommodating individuals. Behaviour does not disappear, there are still three references to it in the last 5 entries, but it is of less relative significance.

There are two particularly interesting trends. Firstly those aspects concerned with strictly organisation/‘teaching’ aspects go down over time and secondly those concerned with learning go up.

Figure 4. Analysis of teacher’s journal entries over 4 time periods.

EC broadly recognised the pattern reflected back from her journal:
I think you get more precise at what you’re looking for. At first, you’re just looking at a whole class picture of behaviour, everybody getting on with work, and then you start looking for other things: groups, individuals, the effect of the question. I think once you’re satisfied that they understand the process, the structure of a SOLE, then you can start to think about the significance of things. They need time to settle in to the process. If they get stuck then you talk about how to overcome problems. In those lessons, there isn’t a problem that can’t be discussed and overcome, some lessons, it’s harder to talk about things in structured lessons.

I think meetings with Paul and David probably also prompted me to reflect on whole school issues.

However she also recognised that it is not only her thinking and behaviour that develops, but also that of the pupils and suggested:

The increase in notebook observations of student dialogue and learning centred talk might be to do with an increase in pupil confidence – they tended to tell me more about what they’re doing later in the year – they were more likely to talk about learning rather than behaviour issues.

This observation is a reminder that classroom interaction and development is complex and has a developing ecology in which any change has consequences for other characteristics.

**Discussion**

Cochran-Smith & Lytle (1999) distinguished three conceptions of knowledge pertaining to teachers. The first was ‘knowledge-for-practice’ produced by academic researchers for teachers to enact in practice. The second is ‘knowledge-in-practice’, which represents the tacit knowledge used by teachers but not articulated or amenable to others. The third conception of teacher learning is "knowledge-as-practice." This differs both from, on the one hand, formal, declarative knowledge about education originating from university researchers, and from practice knowledge, on the other. Such practice knowledge is predominantly tacit, locked in routines and habit, although accessible through reflection. Following the tradition of Stenhouse, ‘knowledge-as-practice’ may derive in part from formal knowledge, but is substantially generated in classrooms when teachers treat those classrooms and their schools as sites for collaborative practitioner enquiry testing both their own theories and those of others in a powerful amalgam. They don’t lose sight of the wider research knowledge base, but the flow of knowledge generation is not one way from theory to practice. Their emergent knowledge is interpreted through connection to wider social, cultural and technological phenomena. We would suggest that this SOLE approach was precipitating knowledge as practice at a rapid pace. We see little sign that the explicit research processes were driving this process, rather it is the opportunity for EC to reflect on practice and her and PD et al. to discuss and articulate practice that has been the motive force for practice development. Explicit research processes provide some focus and some particular insights, which may in other contexts be more important, but here they did not appear fundamental.

4. How can these outcomes best be captured to inform the development of other teachers’ practice?
Finally we turn to how the SOLE method and EC’s practice knowledge can inform others. There are currently three main media formats for facilitating the spread of SOLES as an idea. Firstly there is an edited video of SOLE practice which is being used in introducing the pedagogy to teachers in other schools. We don’t yet have a critical evaluation of this video from teachers but generic feedback has suggested that it provides a valuable general image of the pedagogy and its phased nature, but some episodes seem to trigger anxiety in some teachers. Perhaps this is inevitable. There is also a teacher’s guide (School Support Pack) which has the following sections:

1. Introduction
2. Whole School Implications
3. Benefits
4. Setting up a SOLE
5. What Makes a Good Enquiry Question?
6. The Role of the Teacher in a SOLE
7. The Role of the Student Manager
8. Common Situations

Appendices
1. Self Organised Learning Environments
2. Exemplar student work

The early written feedback from three class teachers in schools which have experimented with the SOLE method is that although it provides some useful guidance, individuals are interpreting the innovation in terms of their ongoing constructs about the pupils in their school and how the school is responding to those (ranging from optimistic to somewhat negative), which in turn partly reflect school cultures. Our starting assumption is that teachers cannot be ‘taught’ how to operate SOLES although they can learn from the experience of others. Ultimately they have to take ownership of the process of establishing the SOLE approach. We take the view therefore that the guide will be best regarded as stimulus to structure and guide dialogue between teachers in schools, where they can express their concerns and problems as well as articulate their successes in planning and practice. Professional learning communities are more powerful when they have a focus and can achieve the meso discourse structures described by Horn & Little (2009) such as ‘walk through’ and ‘normalisation’, where teachers were working on numeracy. With appropriate support and ambition some of these schools and teachers can develop into professional practice communities, and we are ready to provide some infrastructure for that to happen.

In making preparations for this, we are guided by outcomes from a previous practitioner enquiry project (Leat et al. 2006) which analysed the ongoing response of teachers from one school via their journals, who were developing teaching thinking pedagogy in their classrooms. They delineated six stages that most of the teachers provided evidence of experiencing. The data also included
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References to the support that they found valuable at each stage. The findings are summarised in Table 1. There are some interesting similarities and differences in the two projects. It is evident that in the early stages of innovation, practical questions represented by the stem ‘How do I/you … ?’ are expected and teachers need close and immediate support. Both EC and the teaching thinking teachers used a web of support to address their questions and doubts, although EC was more isolated. In both projects questions have been raised over the long term whole school implications of the project and for both projects the teachers have had the opportunity to talk about their work which has had consequences for their identity. The most important point here however is that with most teacher pedagogic and curriculum innovation when significant concerns are encountered, teachers will fall by the wayside and either give up, resist or exhibit strategic compliance if they being ‘forced to change’. It is the collaborative and dialogic resources manifest as the necessary support for concerns and consolidation in the table that gives greater chances of success. It is here that teachers draw upon their relational agency. This, we believe, relates significantly to issues of curriculum policy and enactment raised by (Sarah) Minty & (Mark) Priestly in this symposium and which elsewhere we have conceptualised as Working Space.

Table 1. Phases evident in the journals of teachers engaging in pedagogic innovation (thinking skills)

| Initiation – when you first meet new ideas | The ideas need to come from a reliable source with some credibility |
| Novice - you first try out the ideas | You need practical help from a friend down the corridor |
| Concerns when you worry about the implications and have doubts | You need a group, a network, coaching, an HE module, peers |
| Consolidation – when you overcome the problems | More of the above |
| Expansion – when you see how it is connected and other changes are implicated | You need a book, conference, a course, access to decisions |
| Commitment – when you are changed for good and can’t go back | You need a platform or a pen to tell people what you have done |

References


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