

Applying metaphors for learning to continuing professional development (CPD), in the context of a course for Special Educational Needs Coordinators (SENCOs)

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The literature suggests that understandings of teaching and learning can be classified around two metaphors: acquisition and participation. It is further argued that neither metaphor is sufficient and that both are necessary.

Drawing on material from a larger study related to the professional development of Special Educational Needs Coordinators, the paper uses concept maps and the associated interviews to explore the understandings of the course participants and changes in their conceptualisation over time. The data reveal that individuals do draw on both metaphors and that their progress can be viewed in terms of both acquiring knowledge and also progress from 'novice to expert.'

If teaching and learning, and participants' progress are viewed in this way, there are implications for course development and evaluation. Some of these are considered.

Professional development of teachers is central to inclusive education (Mittler, 2000). This paper is concerned with how models of learning and progress can be used to inform and analyse that process, with empirical evidence drawn from the continuing professional development (CPD) for Special Educational Needs Coordinators (SENCOs). The first section considers understandings of CPD. For the purposes of this paper, the discussion is mainly restricted to formal activities although the value of informal CPD should not be under-estimated. The potential of metaphors for learning in understanding and developing the formal CPD activities is considered, with detailed attention given to Sfard's distinction between acquisition and participation (Sfard, 1998). This leads to an explanation of 'progress' in terms of the evolution from 'novice to expert,' in other words, a conceptualisation of progress within the Sfard's participation metaphor.

The second section applies these theoretical understandings to evidence from an award-bearing course for SENCOs. The data were gathered from course participants on a Post Graduate Certificate course for teachers and involved concept maps and interviews. The evidence suggested that development of those attending the course can be understood not only in terms of meeting the formal assessment criteria but also in terms of progress from 'novice to expert.' Further data that illustrates that the participants make reference to both the metaphors of learning are provided.

Building on existing research about the value of Sfard's work, the third section argues that, if both of these metaphors are evident, there are implications for course providers in terms of how they plan and deliver courses, and also how teachers' progress is conceptualised. Although the focus for this research was an award-bearing course for SENCOs in England, it does draw on evidence from other forms of professional development. Similarly, this research has wider implications for professional development beyond that intended for SENCOs.

Understandings of the professional development of teachers

Evidence exists that indicates teachers' professional development is conceptualised in diverse ways. Job specifications frequently include required and/or desirable qualifications gained through award-bearing courses although this approach can be unsatisfactory. Attendance at and successful completing of an award-bearing course is not necessarily synonymous with professional growth. For instance, achieving accreditation may be indicative of surface learning rather than deep learning, and further, may not be associated with any changes in professional practices. Some bodies, such as the Training and Development Agency (TDA), adopt a different approach, namely seeking evidence of changes in the outcomes for pupils taught by the attendees. Data of this type are elusive, may only be evident in the medium to long-term, and, if detectable, problematic since simple causal links are, at best, elusive and probably non-existent. Intractable complications exist

since the relationship between CPD and changes in professional practice is non-linear and complex (Hoban, 2002). Harland and Kinder (1997, p. 77) observed that participants have “a unique ‘outcome route’ following an in-service experience and rarely achieved exactly the same permutation of outcomes as other colleagues.”

In summary, although (pre-determined) changes in practice are often promoted as desirable outcomes of professional development, it is well recognised that the consequences of CPD ‘disparate and individualistic’ (Harland and Kinder, 1997, p. 81), being partly determined by the particularities of historical and socio-cultural environment of each teacher (Kelchterman, 2004).

In the light of the complexities, this research narrowed the focus to changes in the course participants’ own learning, in terms of changes in their ‘schema.’ This term is used to refer to a mental representation of the world that involved the organisation of concepts which may be revised in the light of new information. The rationale for this focus was that each participant would have pre-existing schema and that any modifications would provide evidence of deep learning which may occur with or without changes in practice. Researching the schema of each individual captured data that were not only associated with reported or observable changes in current professional practice but also the conceptualisations that would underpin future changes in professional practices. The assumption was that changes could largely be attributed to course attendance although clearly other factors such as contact with particular individuals (e.g., a member of the special needs support service or an educational psychologist or a pupil) may also have played a part. Thus, the course is viewed as the major rather than sole influence.

Researchers concerned with the structuring of knowledge, including those studying professional development of teachers (Hodkinson and Hodkinson, 2004, Saban, 2006), have found metaphors valuable. For example, they provide insights into the ways in which individuals learn. In the context of those formally concerned with learning, such as teachers, the metaphors which individuals access ‘profoundly affect [their] thinking about teaching and learning’ (Martinez, Saulea and Huber, 2001). Prawat (1999) further argued that teachers should be concerned with the metaphors that they present to learners in a classroom because of

the implications for learners. In this paper, the significance of an individual’s personal metaphors when they are in the role of learner, when thinking about teaching and learning, and when providing modelling learning to other have been applied to the context of HEI tutors working with teachers.

The metaphors that informed this research were developed by Sfard in whose view the existence of multiple theories for learning created ‘a state of perturbation’ (Sfard, 1998, p. 4). She sought to classify the established and emerging theories with a view to providing a bird’s eye view that exposes ‘the tacit assumptions and beliefs that guide us’ (p. 4). For that process, she argued that metaphors are valuable since they are ‘the most primitive, most elusive, and yet amazingly informative objects of analysis’ (p. 4). She argued that their additional power is that ‘they often cross the borders between the spontaneous and the scientific, between the intuitive and the formal’ (p. 4). In her view, the metaphor adopted will influence the ways of thinking and the activities undertaken.

In reviewing the discourse of learning, she suggested that there was evidence of two principle (or root) metaphors of learning, namely the ‘acquisition metaphor’ (AM) and the ‘participation metaphor’ (PM). The differences between these are summarised in Table 1 below.

The acquisition metaphor (AM) uses terms such as ‘reception, acquisition, construction, internalisation, appropriation, transmission, attainment, development, accumulation, grasp’ (Sfard, 1998, p. 5), whereas terms such as ‘legitimate peripheral participation’ (Lave and Wenger, 1991) and ‘apprenticeship’ (Rogoff, 1990) are associated with the participation metaphor (PM).

Sfard argued that the two metaphors that she identified are not mutually exclusive: ‘theoretical exclusivity and didactic single-mindedness can be trusted to make even the best of educational ideas fail’ (p.11). The rejection of exclusivity also implied a rejection of certainty; the complexities and ‘arbitrary nature of some classifications’ (Sfard, 1998, p. 11) are highlighted. She suggested that the two metaphors can coexist and further that they may need to do so; each can make a contribution but neither is complete.

More recently other metaphors have been suggested (Hodkinson and Macleod, 2010), but if Sfard’s two metaphors

Table 1: A schematic comparison of the two metaphors for learning

Acquisition metaphor		Participation metaphor
Individual enrichment	Goal of learning	Community building
Acquisition of something	Learning	Becoming a participant
Recipient (consumer), (re-constructor)	Student	Peripheral participation
Provider (facilitator)	Teacher	Expert participant, preserver of practice/discourse
Property, possession, commodity (individual, public)	Knowledge, concept	Aspect of practice/discourse/activity
Having, possessing	Knowing	Belonging, participating, communicating

Based on Sfard 1998, p. 7.

are accepted as helpful and, at least, as a partial characterisation of learning, and that exclusivity is undesirable, are they evident in the literature about the professional development of teachers in relation to special educational needs/inclusion? A recent report on the preparation of new teachers to teach pupils with learning difficulties and/or disabilities was framed in terms of knowledge and skills including achieving the nationally prescribed standards (Office for Standards in Education (OfSTED), 2008). This is an example of Sfard’s acquisition metaphor. Consistent with Sfard’s observation, the participation metaphor has been used, though less frequently. Recently, it has been used in relation to developing school-based inclusive practice (Dyson and Gallannaugh, 2007) and continuing professional development (CPD) for SENCOs (Pearson, 2009).

There is evidence that just as when Sfard wrote her paper, the two metaphors are in ‘simultaneous use’ (Sfard, 1998, p. 5), sometimes independently but at other times in combination (Hodkinson and Macleod, 2010). Indeed, in relation to research, Sfard argued: ‘It now seems that we can live neither with nor without either of them’ (Sfard, 1998, p. 10). The next section explores that assertion, from the perspectives of the tutor and course participants, and provides examples of relevant forms of data gathering and analysis.

Applying the metaphors to the continuing professional development

The focus of this study, as outlined above is on the course participants’ schema which poses challenges in terms of identifying appropriate methods of gathering the data and appropriate approaches to analysis. How can insights be gained into individuals’ schema and changes in these? How can both tacit and explicit knowledge (Eraut, 1994) be explored? How can data be gathered that can be analysed drawing on both AM and PM?

An approach which has been adopted by researchers working in other allied areas, who were grappling with these complexities, is concept mapping. For instance, these have been used to explore growth in mathematical knowledge (McGowen, 1999), learning in science (Thomas and Mintzes, 2002; Van Zele, Lenaerts and Wieme, 2004) and teacher development (Kinchin and Allias, 2005; Zanting, Verloop and Vermunt, 2003). It is argued that they provide insights into individual’s schema, and capture explicit and tacit knowledge along with identifying lacunae (Kinchin, Hay and Adams, 2000, Hay, 2007) and may be used in combination with other approaches such as interviews (Zanting et al., 2003). The next section outlines the theoretical background of concept maps and their analysis. The latter term is used to refer to how research can gain insights from the process of concept mapping and from the products in terms of the actual maps.

Theoretical background to concept mapping

Within the constructivist paradigm (i.e., AM), concept mapping (Novak, 1990; Novak, 1998) has been used to explore and support changes in knowledge, and knowledge structure or schema. Concept maps are defined as ‘graphical

tools for organising and representing knowledge’ (Novak and Canas, 2006). Construction of a concept map can be initiated by asking a relevant, meaningful question, for example, ‘What are concept maps?’ This prompt question delineates the focus of the map.

Each concept map is composed of a number of propositions or semantic units which include a concept, a linkage and a concept as illustrated in Table 2 below.

Views vary about how to deal with elements of concept maps that do not conform to this structure. For example, if the linkage is absent (e.g., ‘concept map – knowledge’), it is not a complete semantic unit and as a result the meaning can only be inferred, and therefore, it should be discounted. However, it has been argued that ‘invalid’ links may be significant to the student and therefore potentially interesting.

Opportunities exist for cross-links which join together segments of different propositions and thereby provide cohesion across the map. ‘Cross-links are important in order to show that the learner understands the relationship between the sub-domains in the map’ (Novak and Canas, 2006 p. 12). This theme is further developed later in this section.

The process of producing concept maps can vary; for example, they can be produced, individually or as a collaborative activity, as the completion of a pre-prepared ‘skeleton’ map, structured by the provision of some concepts, or as totally open-ended, an approach sometimes referred to as the ‘construct-a-map approach’ (Shavelson, Ruiz-Primo and Wiley, 2005).

Concept maps have been used for varied purposes including assessment (Rice, Ryan and Samson, 1998), promoting problem-solving approaches (Daley, 2004), revealing patterns of learning (Hay, 2007) and tracking conceptual development (Kinchin, Hay and Adams, 2000). For them to be used in any of these ways, appropriate ways of analysing the maps are needed. Various alternative approaches have been used including architectural approaches (i.e., quantitative measures of their structural complexity in terms of factors such as the number of links and the number of nodes) and level of congruence (i.e., the degree of match with a pre-existing ‘expert’ map). These examples are predominantly located within the AM.

Recently, Kinchin, and Hay and Adams posited the value of a qualitative approach to analysing concept maps ‘to aid learning by illustrating patterns of conceptual development’

Table 2: The constituent parts of a proposition

Concept (Node)	Linkage	Concept (Node)
Concept maps	Portray	Knowledge
Concept maps	Are	Graphical organisers
Concept maps	Are used in	Education

(Kinchin, Hay and Adams, 2000). Their approach differentiated between maps in terms of their complexity, resilience in accommodating additions; the establishment of a context for the key concepts; degree of appreciation of a wider viewpoint and its relationship to the ‘expert’ view (Kinchin, Cabot and Hay, 2008). Based on empirical data, they suggested three broad categories of concept maps, namely ‘spoke’, ‘chain’ and ‘net’, as illustrated in Figure 1.

The distinctions between the three classifications identified by Kinchin, Hay and Adams (2000), are set out in Table 3 below.

For those who portray the knowledge as a ‘spoke’, growth in knowledge can be represented by the addition of a further ‘spoke’ without disturbance to the rest of the map. ‘Chains’ are indicative of procedural sequences and do not demon-

Figure 1: The three main concept maps structures (Based on Kinchin, Hay and Adams, 2000)

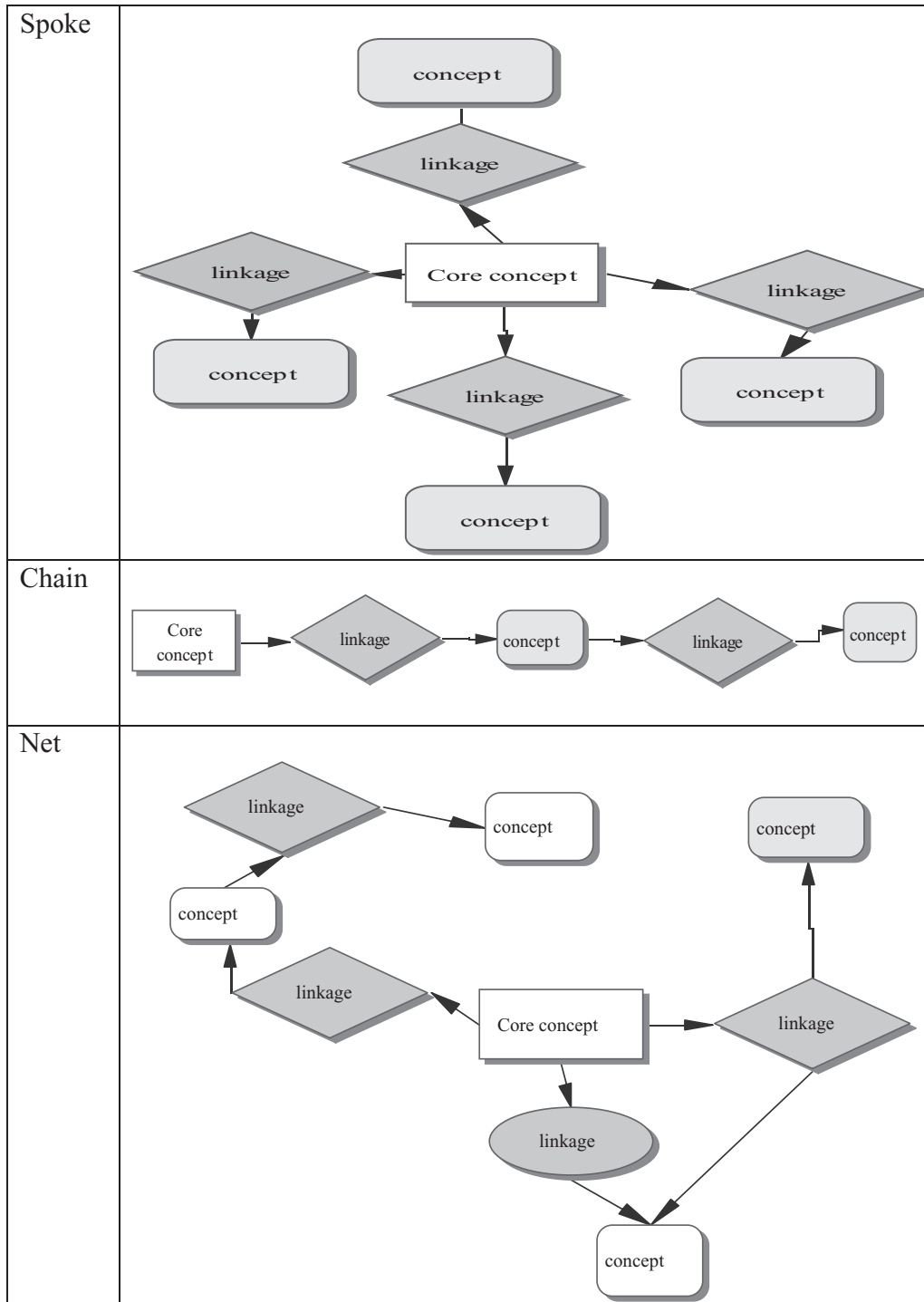


Table 3: Classifications of concept maps

	Spoke	Map type Chain	Net
Hierarchy	One level only	Many levels, but often incorrect	Several justifiable levels
Processes	Simple association with no understanding of the processes or interactions	Shown as a temporal sequence with no complex interactions or feedback	Describes as complex interactions at different conceptual levels
Complexity	So little integration that concepts can be added without consequences for 'map integrity'	Map integrity cannot cope with additions, particularly near the beginning of the sequence	Map integrity is high. Adding one or more concepts has minor consequences as 'other routes through the map are available
Conceptual development	Show little or no 'world view.' Addition or loss of a link has little effect on the overview	Integrated unto a narrow 'world view', suggesting an isolated conceptual understanding. Loss of a link can lose the meaning of the whole chain	Can support reorganisation to emphasise different components to appreciate a 'larger world view' or to compensate for a 'missing link'

Based on Kinchin, Hay and Adams, 2000.

strate an awareness of how these interlink with other concepts. The issue of how to incorporate additional knowledge depends on how it relates to the chain; for example, it might bridge a discontinuity in the chain, it may be easily accommodated in the early stages but 'may be problematic if a workable sequence is already in place as the additional concept may appear superfluous' (Kinchin et al., 2000, p. 47).

In contrast, 'NETS' 'can demonstrate a deep understanding as held by the subject-specialist teacher and therefore illustrate expert knowledge structures to which students should aspire' (Kinchin and Allias, 2005, p. 259). Those who have such an elaborated and integrated overview (Shavelson et al., 2005) are likely to be operating towards the expert end of the novice–expert continuum. This association between type of map and the novice–expert continuum established a link between the concept mapping and PM.

The analysis described above is most often undertaken by someone other than the producer of the concept map, for example, teacher, tutor, researcher. However, the 'mapper' can be involved in some form of analysis or it might be a shared tutor/course participant activity. Kinchin, Hay and Adams (2000) suggested that the drawing of a concept map may help to identify for the course participant and the tutor the dimensions of a student's zone of proximal development (Vygotsky, Rieber and Carton, 1987). Indeed, allowing for or promoting revisions and modifications are valuable. Through scaffolding, individuals may be prompted to review and revise their concept map. Furthermore, it has been suggested that if concept maps are re-drawn after a learning experience, any 'changes in the structure of the representation may mean changes in the students' conceptual frameworks that can help determine the types of changes that take place as a result of instruction' (Shavelson et al., 2005, p. 428), a comment that is consistent in gaining insights into progress conceptualised as changes in individual's scheme.

Valuable data can also be collected by using the concept maps as artefacts within the interviews with the 'mapper.' Kvale (1996) made a distinction between different types of interviews. Some are conducted with the aim of bringing to the surface pre-existing nuggets of knowledge in his terms, a 'mining metaphor' (p. 3), although others involve invitations to co-construct knowledge. For the latter, he used the metaphor of a traveller who engages in a conversation which may be focused around an artefact (p. 11). It has already been noted that the revision and elaborations are valuable.

Data from the concept maps and from the associated interviews with the course participants were used to explore the relevance of Sfard's metaphors to the teaching and learning on an award-bearing course for SENCOs, details of which appear in the next section.

Context of the research

The research was undertaken in the context of a Post Graduate Certificate course provided for (aspiring) SENCOs. This was third consecutive year that this course was funded by the Local Authority (LA) with members of the LA actively involved in some aspects of the delivery. Each year, those registering for the course were predominantly SENCOs who had recently been appointed to that role. However, as part of the succession planning in particular schools, some teachers who would soon become SENCOs attended. Each year, a minority of the participants were experienced SENCOs.

Schools in England (except for categories such as independent and original academies) are required to have a SENCO who is responsible for the day-to-day management of provision for pupils with special educational needs. Their role is context-dependent, complex and often associated with recognising and managing tensions (Cole, 2005; Cowne, 2005; Layton, 2005). Although this is a role with a school-wide remit, recruitment is often idiosyncratic and access to induction is patchy (Pearson, 2008).

In the cohort where this research took place, there were 12 participants: eight from primary schools, one from a specialist provision and three from secondary schools. In common with the national profile of SENCOs, there was a strong bias towards females (11:1). The level of experience as a SENCO varied from substantial (e.g., 20+ years) to none.

During the first day of the course, the participants were introduced to concept mapping. The need for semantic unit (i.e., concept – link – concept) rather than associative links (i.e., concept – concept) was stressed. The use of cross-links was also illustrated and discussed. All the course participants were asked to independently complete a concept map with the prompt question:

‘Please draw a concept map that shows your understanding of the role of SENCO at this point in time.’

Each course participant drew a map without input from their peers. These formed the focus of a group discussion about both the ‘process/production’ of concept maps and also the ‘product’ (i.e., the concept maps) particularly in relation to the concepts and links that had been recorded. During this discussion, each individual had the opportunity to edit their concept map, using a different writing implement so that the revisions were obvious.

The final activity in this session involved comparing the map with the national guidance current at that time about the role of the SENCO (Teacher Training Agency (TTA), 1998). This document was aspirational and provided an outline of the activities that may be expected of a SENCO. The individuals kept their own concept map as part of the course file and a copy of this was retained by the tutor.

About 10 months later during the final session of the course, a copy of the original map was returned to each ‘mapper.’ Each individual was asked to review the ‘beginning of course’ version with the invitation to modify this as appropriate, for example, re-drawing the concept map, editing the original one. All the course participants elected to re-draw the concept map with a copy of this new version retained by the tutor.

As part of a doctoral thesis concerned with continuing professional development (Pearson, 2010), a sample of the six participants was tracked before, during and after the course. The data gathering approaches used included, but were not restricted to, concept mapping and interviews. The concept maps served a dual role both as a source of data and as artefacts within the interviews with individual course participants. This paper is restricted to the data from two of the samples used within the thesis. Samples were selected as representing the extremes in terms of length of experience as a SENCO. The analysis presented

below extends that which was undertaken within the thesis.

The relevance of the two metaphors

The discussion of applying the metaphors is divided into three sections, namely the production of the maps, analysing the maps, and using the maps to support teaching and learning.

Producing the concept maps

The process of producing the concept maps at the start and the end of the course were predominantly within the AM. For example:

- individuals needed to find ways in which to produce a graphical representation of the role of SENCO,
- there were opportunities for scaffolding during the group discussion, and
- revisions were encouraged.

Seeing the maps produced by peers and listening to the group discussion was a learning activity in its own right. It helped to surface tacit knowledge in ways which were non-threatening and regarded as ‘fun’. Lacunae were identified and clarification of terminology and processes (i.e., AM) was safely undertaken.

The discussion stimulated by comparing individual’s maps and the TTA standards raised issues about the distinction between ‘expertise’ and the ‘official perspective.’ What might be described as a healthy scepticism about the TTA document emerged with a feeling that the experienced SENCOs in the group had a more nuanced or alternative perspective. They knew the job ‘from the inside’ (comment by an inexperienced SENCO). This suggests that, at an intuitive level, they were applying the PM.

Analysing the concept maps

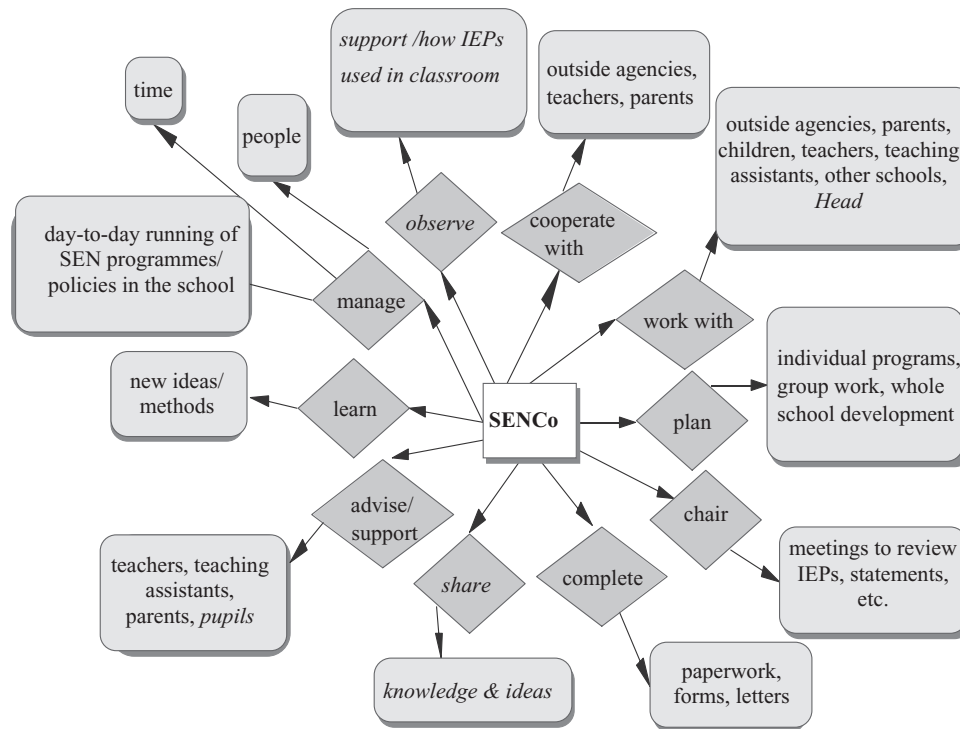
Using the approach of Kinchin, Hay and Adams (2000), the initial and final concept maps of the six of the course participants who formed the sample for the doctoral thesis were analysed by the tutor. They provided the opportunity to draw on both metaphors for learning. This is exemplified by the findings from two of these SENCOs with very different levels of experience.

Liz

Liz had 16 years of experience as a SENCO and worked in a school catering for children 4–11. At the start of the course, she had just become an Assistant Head. Her role was as an Inclusion Coordinator combining responsibility for SEN and gifted and talented. Her teaching responsibilities were for Year 6 and she was also KS2 Coordinator, History Coordinator and Geography Coordinator. Her school was larger than average although there had been a decrease in enrolment. The school had a lower than average number of pupils with SEN.

She was a leading SENCO within the LA; that is, she had been recognised as having outstanding expertise and the ability to offer peer-to-peer support to colleagues.

Figure 2: The initial concept map drawn by Liz



This meets most of the criteria for a ‘net’, for example, there is more than one level; she was also able to integrate some new ideas from the group discussion into the map (e.g., work with *Head*) or the addition of ‘support’ alongside ‘advise’ which showed that with scaffolding she had an enhanced appreciation of a ‘larger world view’ (i.e., PM). It was noteworthy that she independently included ideas such as seeing herself as a learner and recognising the links with bodies beyond her own school (e.g., *outside agencies*, other *schools*). This evidence justified categorising the concept map as a ‘net’ (see Figure 2).

Hannah

Hannah worked in an average-sized primary school serving a mining community. It had a lower than average number of pupils with special educational needs. Attached to the school was a provision for visually impaired pupils with its own staff.

Her responsibilities were with the Early Years provision and she had no real contact with other age groups. Concurrent with the start of the course, she had been appointed as an acting SENCO. This appointment was confirmed during the period of the course. Hannah was responsible for the Foundation stage within the school.

The difference between the independently produced concept map and the one after a group discussion were, in the case of Hannah, so great that they are presented as two different figures.

This sparse concept map described, in Hannah’s words, ‘all I can think of’ (i.e., AM) (see Figure 3). She showed no distress about engaging in the activity although she did become aware that she had finished far earlier than the others. Within the concepts used, there was an emphasis on formal procedural aspect of the role of SENCO (e.g., IEPs, referral) and the individuals that she was likely to come into contact with. It met the criteria for a ‘spoke’ concept map.

As the group discussion evolved, Hannah edited her concept map as seen in Figure 4.

This was a more complex concept map with the number of ‘spokes’ more than doubled. The inclusion of the term ‘research’ was interesting since it can be directly attributed to a particular course member who uniquely suggested this aspect. Some cross linkages were included, for example, refer – manage. However, all of these were likened to the term ‘refer’ and it is plausible that these indicate a refinement of her understanding of the implications of the term. Each of the cross links are to her original terms rather than the revisions so that the new concepts are not integrated. Her map, therefore, had some elements of a net but they only occurred with support.

The revisions based on the group discussions (italics in Figures 2 and 4) provided some evidence that concept maps are not stable and that the course participants were, with support, prepared to revise their concept map. A

Figure 3: Initial concept map drawn by Hannah prior to the group discussion

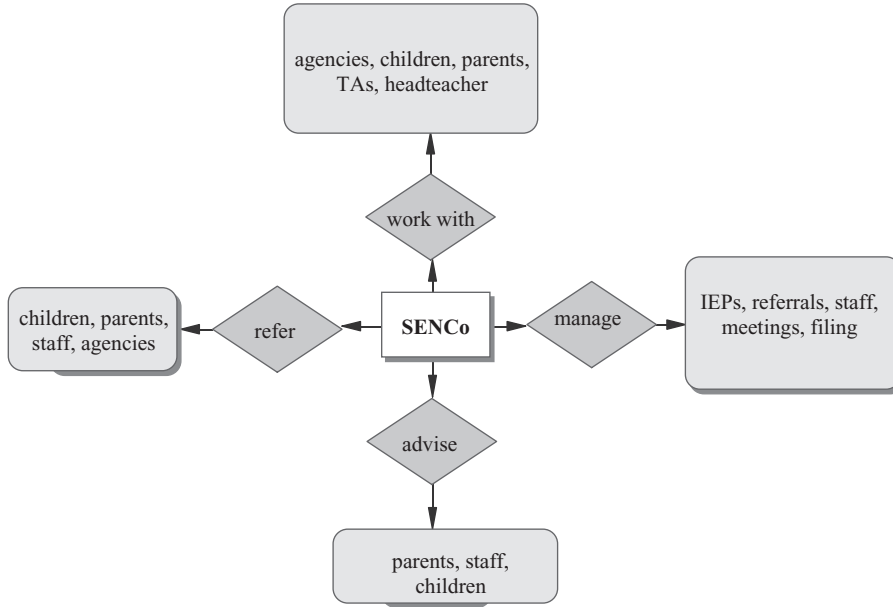
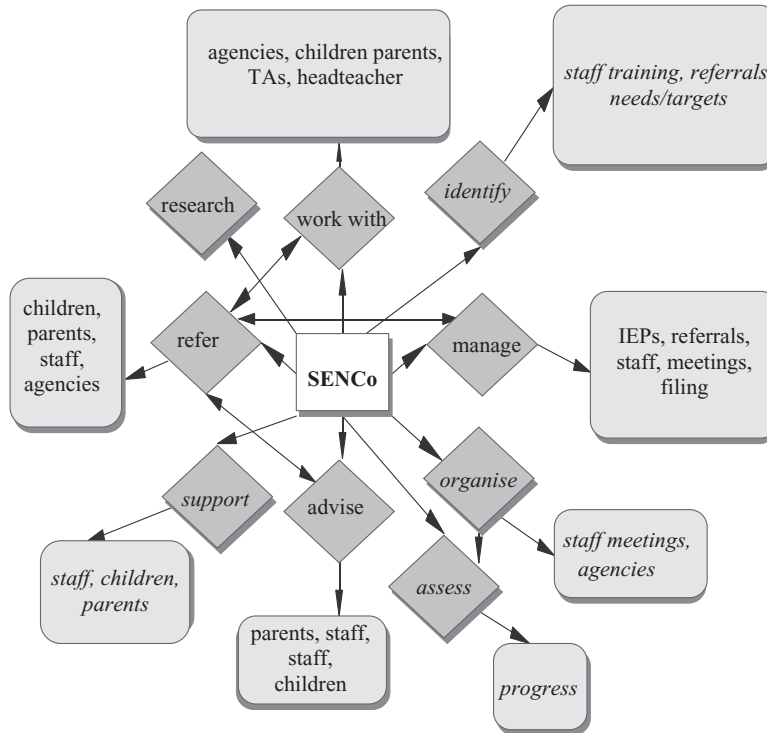


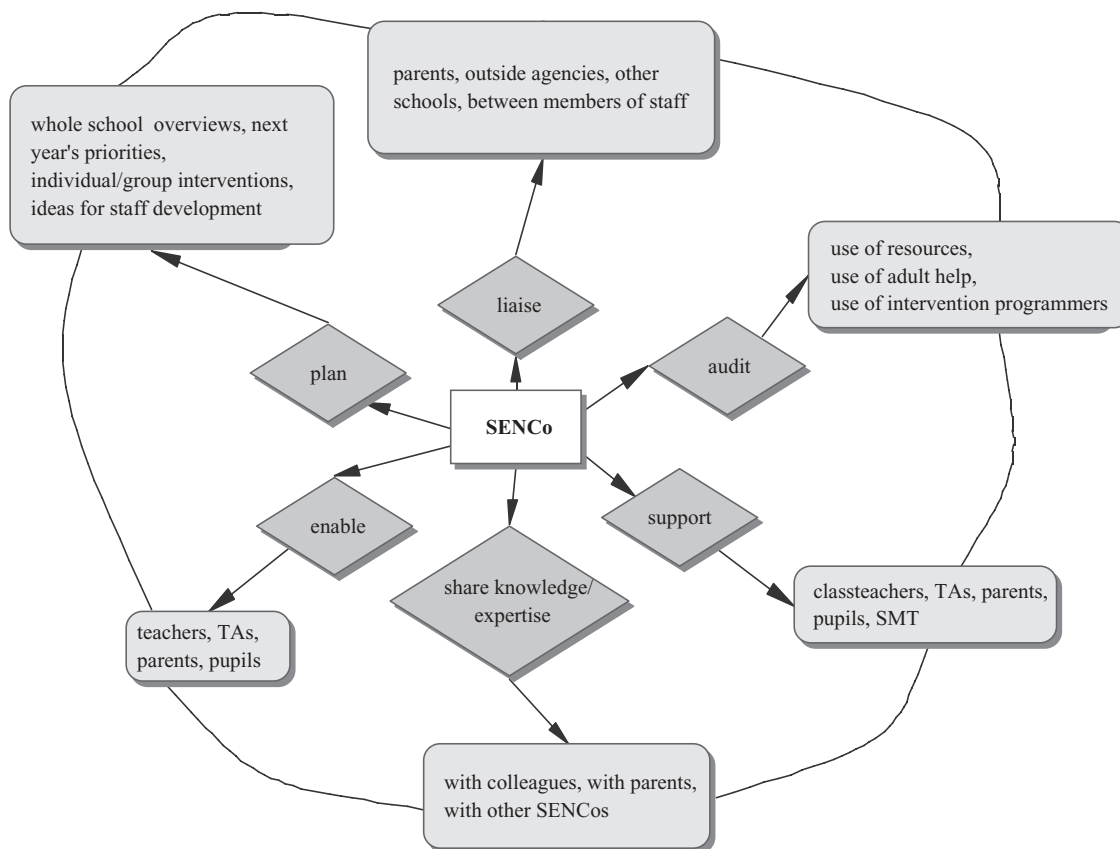
Figure 4: Initial concept map drawn by Hannah after the group discussion



criticism is that the representation of the reorganisation of the ideas may have been limited since both participants only edited a pre-existing concept map (i.e., one drawn earlier in the session). The potential of rejecting the concept map and restarting the activity was not explored at this stage.

In terms of the PM, the concept maps 2 and 3 (i.e., the one by Liz and the one by Hannah) suggest that there were marked differences between a relative 'expert' and 'novice.' Hannah's first version (Figure 3) was impoverished not only in terms of the number of spokes but also in terms of the concepts referred to.

Figure 5: Concept map produced by Liz in the final session



As explained earlier, in the final session, the original concept maps were returned to the course participants who were asked to review and revise them in whatever way they felt appropriate. Those of Liz and Hannah are presented below.

Liz

As noted above, Liz was a highly experienced and well-regarded SENCO. This raised a question as to whether the course would alter her schema, given that experts’ maps are expected to show resilience (i.e., openness to change). When the original concept map was returned to her, she reviewed it thoroughly, talking herself through it. The second concept map appears in Figure 5 below.

This concept map was again a ‘net’ but a more sophisticated one. During her contemporary discussions of it, Liz wanted to emphasise the inter-connection that she now perceived by explaining that she had drawn an encompassing circle only (rather than many interconnections) so as to preserve the clarity of the map. She wanted to explicitly state that she saw it as a complex, multi-dimension role but that she wanted to ensure graphical clarity about how she now understood the role. This decision could be interpreted as her, as an expert, deploying her expertise by being selective.

Hannah

Hannah was initially taken aback when she saw her original version; she remembered that others in the group had

created more complex concept maps. She willingly set to work on a second version. Again, it was speedily produced but for rather different reasons. (Figure 6)

Her original version of this has been used rather than one set out using Inspiration software since the image captures some of her energetic (frenetic) approach. Her peers referred to it as ‘spaghetti junction’, a label she appeared to be comfortable with. In this case, Hannah was not yet exercising the type of ‘selectivity’ of an expert but had an emerging holistic view.

Using concept maps as a support to teaching and learning

Sfard argued that the link between theory and data is dialectic; a comparable link between teaching activities and theory is plausible. Course providers will reveal their theoretical orientation though the style of teaching they adopt and the activities in which the students engage. This section, drawing on both AM and PM) considers the value of repeated concept mapping as a support to learning for both the tutor and the course participants. It draws on the interview data from Liz and Hannah.

Six months after the course was completed, during the course of an interview, Liz reviewed her two concept maps. An extract from this appears below with comments from the author in parenthesis.

The excerpt demonstrates her intuitive use of both the AM and the PM. With regard to the first, she commented on how to structure her knowledge while in terms of the second, she also talked about a wider world view (a bigger picture) which has been associated with being an expert. Reflecting across her two concept maps, she was able to describe her own progress within the PM.

Hannah also used both metaphors during her final discussion of the concept maps.

Hannah: *Ha ha, my fun diagram (second concept map). I think I was tripping actually when I did this.*

Interviewer: *You were what?*

Hannah: *Tripping. But in one way (but) in one way, it is still the same. I think that I had separated the role of SENCO to begin with (first concept map), and not seen it as connected to a lot of things (that) it is connected to. It is connected to the parents. It is connected to the teachers, to the training, and how TAs interact with the children, the children themselves, how the children see other children.*

Interviewer: *So would it still come out like this?*

Hannah: *Maybe not quite so wild but I would have a lot of things still joining. . . .*

Interviewer: *So it would still be highly interconnected?*

Hannah: *Yes it would. But maybe not quite Spaghetti Junction.*

She clearly described complex interactions between the various items and her progress towards a wider world view (i.e., PM). The process of reviewing the concept maps helped her to think about her own progress during and beyond the course; her on-going journey from novice to expert. In the interview which took place at the end of the course, she was able to associate the changes in her concept map with her acquisition of knowledge:

'I really didn't know that parents were supposed to come in and be involved and that children are supposed to be involved.'

These cameos illustrate how both these individuals are drawing on both the metaphors and that, using these in reference to the concept maps, helped them develop a nuanced understanding of their own professional growth.

Implications of the Sfard's metaphors for professional development

As noted in the introduction, the metaphor adopted will influence the ways of thinking about learning, the perceptions of the links between teaching and learning, and the modelling by the tutor for learners. In line with the comments outlined earlier from Martinez et al. and Prawatt, this section considers those from the perspective of the course provider.

There was evidence that the course participants were drawing on both metaphors and also there was evidence of the processes that Sfard described:

'they enable conceptual osmosis between everyday and scientific discourses, letting our primary intuition shape scientific ideas and the formal conceptions feed back into the intuition.' (Sfard, 1998 p. 4)

SENCOs do not simply need to acquire a body of knowledge and set of skills; they also need to 'become' SENCOs. The role spans several communities of practice whether it be those who work in a particular school, the local and national communities of practice composed of SENCOs or the communities of practice of all those engaged in promoting inclusive education. However, restricting the understanding of the role to one of participation is unrealistic; the AM-based discourse is firmly established; it is embedded in the systems, policies and structures. Beyond being unrealistic, according to Sfard's work, it is undesirable, both metaphors are necessary. Additionally, based on this evidence, course participants draw on both metaphors.

Therefore, if both metaphors are in use and perceived useful, what are the implications for course providers? The answers to this question are grouped around two themes, namely planning and delivering courses, and tracking professional development.

As an award-bearing course, the planning and delivery had to take into account the AM; it was necessary but arguably not sufficient perspective. The PM can and arguably should be used. There are current examples of this in relation to HEI-based course. McArdle and Ackland wrote about a formal undergraduate course (McArdle and Ackland, 2007), a context that must have elements of the AM. Their paper described how the tutors sought to facilitate sense making between communities of practice that are concerned with learning about practice and communities of practice with the purpose of delivering a service (McArdle and Ackland, 2007 p.108). They did not leave this to chance but considered how the transitions between the communities could be managed. Both AM and PM influenced their thinking and activities.

Drawing on the participation metaphor can also provide a supplementary way in which to think about the desirable and actual outcomes of CPD, the progress. Rather than progress being solely associated with the AM, other dimensions can be explored through the PM. Moving from novice towards being an expert (Lave and Wenger, 1991), awareness of others within a community of practice and the existence of multiple communities of practice are all desirable outcomes from continuing professional development. Working within the PM perspective provides additional ways of conceptualising increases in the capacities of the individual, their schools and the education system in general. Such aspects may be overlooked in a culture that prioritises the AM and that preoccupation needs to be challenged. Professional growth comes in many guises and, as Sfard argued, exclusivity is dangerous.

Conclusion

The development of teachers is complex and some of the measures used give attention to superficial factors or make naïve linear connections between CPD and outcomes. This research treated changes in schema as an underlying, significant factor. The case was made that it is helpful to consider the root metaphors that underpin theories of learning and drew heavily on the work of Sfard. She argued that combining the metaphor can be advantageous and cautioned against ‘the dangers of just choosing one’ (p. 4). The course because of it is award-bearing necessarily draws on the acquisition metaphor; successful completion of the course leading to the award of a post graduate certificate requires the participants meet the assessment criteria. Theoretically, this paper argued for the relevance of the PM as providing a valuable, supplementary perspective. In the empirical data, there was evidence of the participants accessing both the metaphors. This was illustrated by data associated with the production, analysis and reflections on concept maps.

This theoretical discussion supported by empirical data has implications for professional development. Potentially both metaphors can enrich the planning, enactment and evaluation dimensions. The PM is arguably under-used in understanding continuing professional development for teachers. This example related to SENCOs but the principles have a wider application. Consistent with the title of Sfard’s paper (Sfard, 1998) which referred to the dangers of over-reliance on a single metaphor, it has been argued that applying at least two root metaphors may provide a secure base from which to plan professional development, to select the activities undertaken and to develop a more comprehensive understanding of professional growth.

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