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Using a social semiotic approach to multimodality: researching learning in schools, museums and hospitals

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Using a Social Semiotic Approach to Multimodality: Researching Learning in Schools, Museums and Hospitals

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Abstract

The aim of this paper is to show how a substantive area of social research –learning– can be investigated using a multimodal social semiotic approach. We apply the approach to three different institutions – a school, a museum and a hospital, illustrating key concepts and addressing issues around pedagogy and technology in contemporary society.

A multimodal social semiotic approach focuses on meaning-making, in all modes. It is a theoretical perspective that brings all socially organized resources that people use to make meaning into one descriptive and analytical domain. These resources include modes such as image, writing, gesture, gaze, speech, posture; and media such as screens, 3 D forms of various kinds, books, notes and notebooks. All of these modes and media are also used in environments designed for learning. That makes a multimodal social semiotic approach particularly apt for studying learning.

Contents

1. Introduction

The paper illustrates three ways in which a social semiotic perspective on multimodality can illuminate learning. First, it shows how 'educators' represent the world and establish pedagogic relations through multimodal *designs for learning*. We explore this in Section 2, where we discuss an excerpt from a textbook for secondary schools, a museum exhibition, and a demonstration in a science lesson in a primary school. Second, a social semiotic approach to multimodality draws attention multimodal *signs of learning*. This is the focus of Section 3. Here we look at signs of learning in the drawings and in the bodily actions of learners: drawings made by some of the visitors of the museum exhibition and some of the students in the science classroom (Section 3.1); and the bodily actions of a medical student who assists in a surgical operation (Section 3.2). Third, a social semiotic approach to multimodality enables researchers to investigate *social, pedagogic, and technological change*. We illustrate this in Section 4 by comparing multimodal designs for learning in the early and mid-2000s in a secondary school classroom in London. In the concluding section of the paper we revisit some 'old' notions related to learning -'explication', 'canonicity', and 'competence'- to further illustrate a multimodal social semiotic lens.
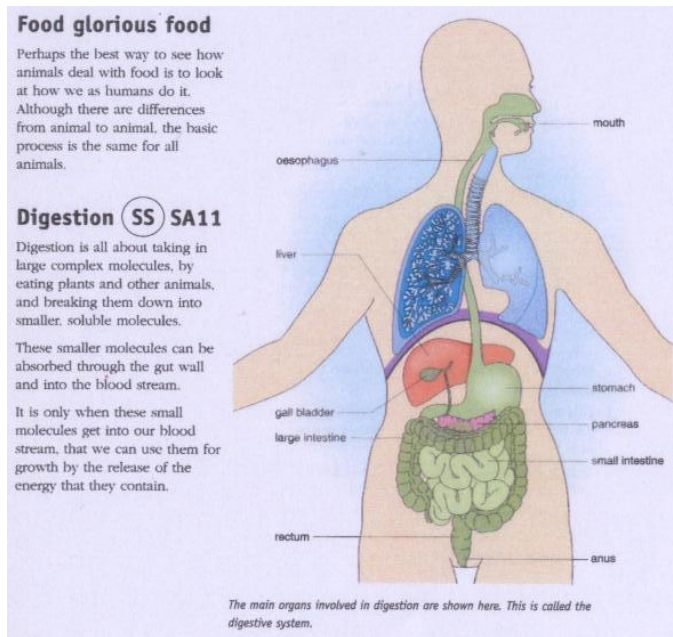
The paper is itself pedagogically framed. We aim to sketch out a theoretical lens, a social semiotic 'gaze', introducing key concepts (listed in Box 1) and using data excerpts taken from a number of different research projects. We do not discuss the (qualitative) methods of data collection and analysis used in the projects from which the examples are drawn. References to project reports can be found at the end of the paper, and future MODE working papers will introduce a number of different multimodal methods. One methodological point we would like to make is that the approach presented here brings together different materials as sources of evidence, ranging from drawings to video recordings, from photographs to field notes, and it seeks to develop semiotic categories that enable us to understand the differences as well as the similarities between these materials.

Box 1: Key concepts in Multimodal Social Semiotic Research on Learning

Mode
Medium
Affordance
Interest
Ensemble
Designs for learning
Reading path
Curriculum
Sign of learning
Transformative engagement
Canonicity
Competence

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2. Multimodal designs for learning

In all communication, in all domains of the contemporary social world, meanings are made in ensembles drawing on and consisting of different modes: with gestures and speech, with objects, in writing, with images, gaze, through posture, and actions of other kinds all contributing meaning; always with several of these orchestrated in complex conjunctions. Each of the modes in such ensembles offers specific affordances, that is, potentials for communication. As a quite usual example, consider Figure 1.

Food glorious food

Perhaps the best way to see how animals deal with food is to look at how we as humans do it. Although there are differences from animal to animal, the basic process is the same for all animals.

Digestion (SS) SA11

Digestion is all about taking in large complex molecules, by eating plants and other animals, and breaking them down into smaller, soluble molecules.

These smaller molecules can be absorbed through the gut wall and into the blood stream.

It is only when these small molecules get into our blood stream, that we can use them for growth by the release of the energy that they contain.

mouth
oesophagus
liver
gall bladder
large intestine
stomach
pancreas
small intestine
rectum
anus

The main organs involved in digestion are shown here. This is called the digestive system.

Figure 1: Excerpt from a Science textbook (Science Education Group 2002, p. 90)

Figure 1 is an excerpt from a Science textbook for secondary education in England. Here, writing provides a *description* of the processes and entities involved in digestion: taking in, eating, breaking down, molecules, energy, et cetera. Image provides a *depiction* of the shape, size and placement of the organs involved in those processes. Without the use of either the one or the other, the information provided by the written account or the image alone would be severely limited, relative to the information which the curriculum suggests is needed. That is one of the key premises of multimodal social semiotics; that meaning-makers always draw on a multiplicity of modes to make meaning. These modes are put together, organized, arranged, into a multimodal design. The makers of the text in Figure 1 have used writing and image, but also typography, and layout, as modes of representation. Selections are made in each mode (we just mentioned the processes that described and the shapes that are depicted); and each mode offers ways to highlight that to which the learner's attention is to be drawn. For instance, in typography, the size and weight of type is used. This is how the makers of a text can create reading paths and shape how learners navigate the text. In other words, the design is a sign of the interest of the 'educator' (used here metonymically to refer to all those involved in the making of the text, including authors and graphic designers).

Multimodal designs for learning can be found in the two-dimensional space available in a textbook, as well as in three-dimensional spaces such as classrooms and museums. To provide an example of the latter, we turn to the design of a museum exhibition. In museums, curatorial teams design environments for visitors to engage with. An exhibition, such as 'London Before London' at the Museum of London, presents arrangements and displays of 'cultural objects' - original archaeological artefacts as well as replicas, texts, labels, models, computer screens, sounds, lighting, reconstructions of prehistoric huts and panels of all kinds in space (see Figure 2).

The design of the exhibition suggest a particular take on the world: how this world might have been and could be imagined, what is known of the past and ways in which it should be viewed in the present. In the exhibition, the left-hand side of the exhibition space for instance, consists of a continuous glass case filled with objects with captions, against a plain background flooded by blue lighting. Many of the objects displayed were found in the Thames, and the choice of lighting suggests a relation of the objects to the river. However, the manner of display - in large glass vitrines, as well as the lighting - lean heavily on or reproduce an aesthetic much more familiar from an art gallery. This indicates the curators' interest to endow the objects with the status of works of art, using resources of display more usually found in an art gallery.
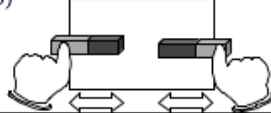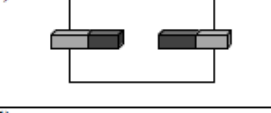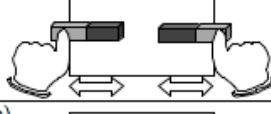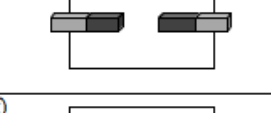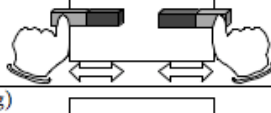

Figure 2: Image from the 'London Before London' exhibition

The right-hand side of this exhibition has wooden panels alongside some display cases. It is an arrangement dominated by writing, with suggestions of environmentalist, spiritual and poetic genres introducing an aesthetic discourse. At the same time here too there is an interest to ground the information scientifically through graphs, bringing 'scientific evidence' from various disciplines and with 'scientific discourse' as a framing in some texts. These overarching discourses - aesthetic, environmentalist, scientific and mixtures of these - regulate the design and reflect the interests of meaning-makers in the design team, their epistemological positions, as well as larger level museum policies. The exhibition resonates with an overall interest in foregrounding the prehistoric artefacts, together challenging current perceptions about their importance and that of the period.

As in the textbook, the multimodal ensembles and their spatial disposition suggest 'reading' paths for the visitors, via organising principles for constructing salience in the various modes, including that of layout. Criterial aspects of the representations, such as colour, size, angle, and position have an effect on the choices the visitors are encouraged to make in navigating the space, as well as on how they might 'accommodate' their interests through what is made available. Similar observations can be made about the textbook example. Both examples show how a body of knowledge, a 'curriculum', in educational terms, is articulated multimodally, using the resources available to the educator. Our next example shows how other sites, such as classrooms, make available a different set of resources.

The example was taken from a primary classroom in London. It features a teacher and his class of students aged 7 and 8 years. He articulates a part of the science curriculum –"forces"– by reading out the unit- and lesson-objectives from a screen, asking questions, enacting processes, making a mind map, which is copied by the class, and showing different kinds of magnets. He uses a range of modes for communicating at the same time: *placement* of 3D objects, *action* on and *gesture* above the objects, and *speech* (see the multimodal transcript in Figure 3). With this multimodal ensemble the teacher establishes 'experimental conditions' and invites the class to predict what would happen "if I move them [i.e. the magnets] closer together". Choosing to use the 'visualiser' in the classroom – a digital display technology that magnifies whatever appears in view of a video recorder on the whole-class screen – was a way of directing the attention of the class.

	Gesture		Speech
(a)		places the bar magnets on the visualiser	*okay (.)*
(b)		touches each bar magnet and adjusts them slightly	*two bar magnets (..)*
(c)			*now looking back to what our aim for today was (.) Tom (.,) okay (..) we will learn that forces act between two magnets (..)*
(d)		touches each bar magnet and adjusts them slightly	*so there are our two magnets okay (..)*
(e)			*what do you think (.) think about this (.) don't put your hands up for now (.)*
(f)		touches each bar magnet and adjusts them slightly	*if I (..) move them*
(g)		brings fingers together above the magnets	*closer together (..)*
(h)			*then let go (..) what do you think would happen to the magnets?*

Figure 3: A multimodal transcript of a demonstration in a science lesson

The three examples discussed so far show not only that the different sites –textbook, museum, classroom- make different sets of modes available, they also show that this leads to different potentials for what might be learnt ('curriculum') and what involvement there is of learner and educator in the production of a school subject. 'Pedagogy', in this approach, is the transposition of social relations from the social world around the school into the classroom, as a metaphor of what kinds of social relations can be imagined, and which the school might prefer.

3. Multimodal signs of learning

In this section we explore how learners respond to the multimodal designs for learning discussed above. We shift attention from the interest and design work of 'educators' to the learner's displays of engagement. We focus on learners' multimodal signs of learning in their drawings (Section 3.1) and bodily actions (Section 3.2).

3.1. Drawings

Before we look at drawings made in schools and museums we consider an instance of learning in an environment which was framed and constrained somewhat differently. A three year old, sitting on his father's lap, draws a series of circles, seven to be exact (see Figure 4). At the end he says: "this is a car".
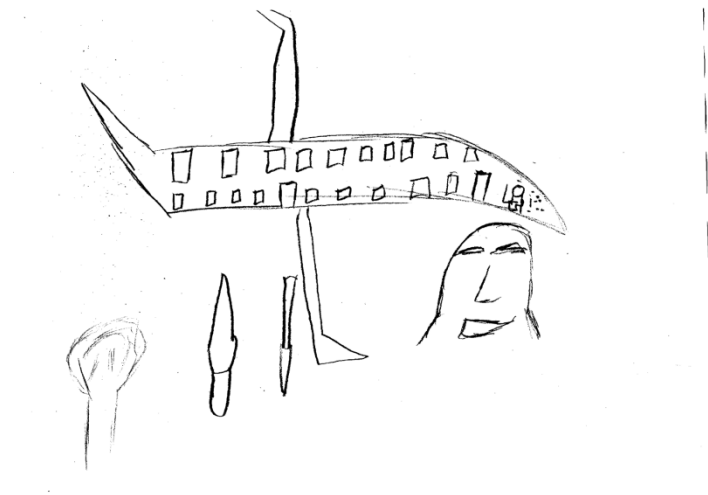
Figure 4: Drawing by a 3-year-old child

Whether from the perspective of learning or of meaning-making, the question arises as to how this is or could be "a car". While drawing, he had said "here's a wheel, here's another wheel, that's a funny wheel…. This is a car". In other words, for him the criterial feature of a car was its 'wheelness', that it had (many) wheels. Wheels were represented by circles; and 'car' was represented by the arrangement of seven circles. To represent wheels by circles rests on a process of analogy: wheels are like circles. The result of the analogy is a metaphor; similarly with the representation of car - 'a car is many wheels'. The meaning made here is a succession of two metaphors: wheels are (like) circles; and many circles are (like) a car.

We might ask further why, for this child, wheels could be the criterial feature for 'car'. If we imagine the eye-level of a three year old, looking at the family car (in this case a 1982 VW Golf, with its prominently visible wheels, especially at the observer's height) we might conclude that this meaning-maker's position in the world, literally, physically, but also psychically, affectively, might well lead him to see cars in that way. His drawing therefore represents his 'position', his 'interest', arising out of his (physical, affective, cultural, social) position in the world at that moment, vis-à-vis the object to be represented. From the perspective of learning we can say that his interest shapes his attention to a part of the world and, in this, acts as the motivation for principles of selection.

Our point is that it is the *interest* (in the sense just given) of the meaning-maker which determines what is taken as criterial about an entity by her or him at the moment of its representation. The child's drawing suggests a view of the world that is historically, socially and culturally shaped. What the meaning-maker takes as criterial then determines what (s)he will represent about that entity. Only what is criterial is represented; other features are left out or are backgrounded. Hence representation is always partial. The drawing is the result of the child's work in his engagement with the world, embodying his (distinctly different) interests.

In taking a drawing as a *sign of learning* we suggest that as a result of the process of engagement with a part of the world, the child has made meanings for himself, outwardly, visibly, new ways of conceiving of the world, new 'concepts', and has integrated these into his inner conceptual resources. In that process the child's entire set of resources is transformed, the resources have been augmented: learning has taken place. The child has achieved an augmentation of his capacities for representation, through his making of new meanings. In that approach, every drawing, any representational form, every sign made, is new, an innovation; its making is 'creative'. The serial, ongoing process of *transformative engagement*, integration and inner transformation, together with the newly resultant state, constitutes learning. This is so whether the sign has been made outwardly – as in the drawing or in something said or gestured – or inwardly, in the process of engagement, selection, transformation, 'inwardly'. Whether in meaning-making or in learning, interest is decisive. It forms the basis of the choice of what is taken as criterial about the entity for representation (the wheels of a car); of the apt means for representation (e.g. a drawing instead of speech); and for transforming that with which the learner has engaged. In learning, the interest of the learner shapes attention to that which is to be learned, leading to selection from what is presented in the world, and (the learner's) interest determines the focus on what is to be engaged with in learning.

These concepts –signs of learning and transformative engagement- can be used to analyze drawings in any context. For instance, in the museum study introduced above the researchers tried to gain insight in visitor experiences by asking them to 'remake' the meaning of the exhibition as a drawing (instead of asking them to produce a spoken narrative). Figures 5-6 show the drawings of two visitors. Figure 5 shows the drawing of a 12 year old boy visiting the museum with his mother. He chose to construct a drawing that shows an aeroplane, a tree, a spear, a tool and a skull. These elements 'stand for' items that were particularly salient for this visitor. His attention had been drawn – among other things - by a small model of an aeroplane within a diorama, which explained that the contemporary site of Heathrow airport was a site of archaeological importance. The drawing shows his interest starkly. His experience of the exhibition was in a significant way shaped around the model of the aeroplane and what that evoked for him, in the environment of that exhibition.

Figure 5: A twelve year old boy's drawing

In another instance, Figure 6, the drawing of an 18 year old woman shows the skull of a bull at the top left of the map while the rest represents scenes from everyday life in a settlement. The main function of the skull may be to indicate the presence of just such a large skull at the entrance to the exhibition, quite clearly the model for the one she drew as a key feature. Her drawing transforms the resources she had selected in a far-reaching fashion, and re-frames them to create an account to explain the skull. In a multimodal social semiotic approach this counts as signs of what she has 'learned', for instance, about the tools people used for hunting and cutting, how they made pots for cooking and how they prepared their food.
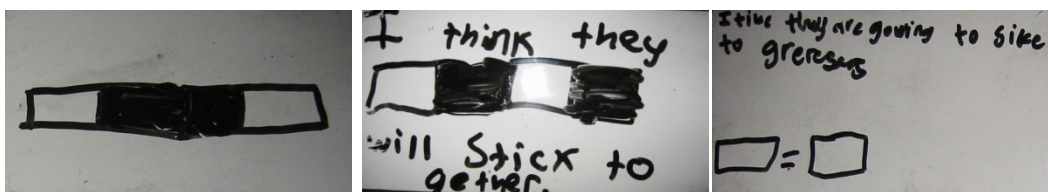
Figure 6: An 18 year old visitor's drawing

More specifically, the examples show what selections and alterations the visitors made as they re-presented the exhibition as a drawing. From a multimodal social semiotic perspective these selections and alterations point to the (socially shaped) interests of the drawers.

Similar processes of transformative engagement can be observed in classrooms. Figure 7 shows some of the drawings made by primary school students in response to the teacher's demonstration of forces described above. Without exception the class drew the bar magnets displayed on the screen as rectangles in a horizontal alignment. In this way, they demonstrated their learning about the experimental conditions that would be required in subsequent hands-on investigation. Not mentioned in speech, this interpretation was construed from their teacher's positioning of the objects. At this point in the lesson, no reference had been made to the two poles of a bar magnet. The students had to decide whether or not the differently coloured ends were significant for the experiment. Positioning as separation and conjoining was a dominant means of showing predicted experimental outcomes.

Figure 7: 'Magnets': *Dry-wipe whiteboard hypotheses*

In the context of the lesson, a drawing alone was not only an entirely valid response to the teacher's instruction, but was perfectly adequate where everyone shared the knowledge that divided rectangles represented bar magnets and that their positioning hypothesized the result of a forthcoming investigation. This 'situated obviousness' may not be sustained beyond what was 'the shared known' of this lesson. Some children added writing, either to lexicalize the drawn prediction or to distribute experimental conditions and outcomes between the modes of writing and drawing. Four students added wavy lines between their images as a means of theorizing magnetic force.

So what were the signs of learning in these drawings? Firstly, the task demanded attention to the curricular subject matter of magnetic force within a particular pedagogic framing. Certain experimental conditions were stipulated, and prior experience and knowledge were brought to bear in the context of introductory activities and interactions. Imagining possibilities by showing or lexicalizing movement was sufficient for the time being.

(81 per cent of the class predicted attraction, which is scientifically incorrect.) At this point 'getting it right' was not an imperative; by the end of the lesson, it was. Secondly, the task entailed remaking of the teacher's demonstration. In interviews, students talked about their experience of magnetic attraction in earlier schooling and at home (e.g. games and fridge letters), but they had not made this sort of prediction before. In representing their hypotheses graphically, there was learning as they selected the resources of drawing and writing for what was, for them, a new purpose. Thirdly, the task of hypothesizing was just one activity amongst others. The students also discussed and enacted the processes of attraction and repulsion, and, in a summative worksheet, arrows were stipulated as a resource for showing directional movement. As far as the lesson was concerned, these whiteboard predictions were incremental in the process of learning.

3.2. Bodily action

So far we have identified and analyzed signs of learning in drawings. These drawings were produced at different times and places. The museum visitors made their drawings up to an hour after their first engagement with the exhibition, in a room away from the exhibition. The school children made their drawings minutes after the teacher had demonstrated what might happen when two magnets are pushed together, whilst still in the same classroom. Now we turn to analyzing signs of learning in body movements, produced as immediate responses to the movements of others. Indeed, a multimodal social semiotic perspective draws attention to 'interaction' as much as to the 'artefacts' produced in interaction, such as the drawings discussed above; and it looks at interaction not just from the perspective of the 'educator' but also from the perspective of the learner, which is what we aim to do in this section. Here we take our examples from a study on learning in the operating theatre, but signs of learning in bodily action can and have also been studied in classrooms, museums and other contexts.

The example is focused on the interaction between a surgeon and a medical student as they are performing a (relatively minor) operation under general anaesthesia. The medical student's task is to hold retractors in place, allowing the surgeon to excise a small lump just above the patient's navel. We identified three ways in which the trainer and trainee positioned retractors during the operation. First, *the trainer positioned* the retractor herself and then handed it over to the trainee (see Table 1, Example 1), or adjusted the positioning of a retractor already held by the trainee by placing her own hands over the trainee's. Second, *the trainer described* where the retractor needs to be positioned, for instance by saying, "Slide that one in a bit more laterally", while pointing to a retractor held by the trainee (see Table 1, Example 2). Third, *the trainee positioned* retractors himself, on his own initiative and (seemingly) without directions from the registrar (see Table 1, Example 3). Table 1 provides close-up video stills of the different approaches to positioning the retractors.

Example 1: Trainer positions	Example 2: Trainer tells and points out where to position	Example 3: Trainee positions
"Just hold it there"	*"Slide that one in a bit more laterally"*	

Table 1: Three different approaches to the positioning of retractors

Table 1 shows how teacher and learner use a range of communicative resources to manage the positioning of retractors. In Example 1 trainer uses hand gestures to signify to the trainee where and how to hold the retractor. Her verbal comment ("Just hold it *there*") is only meaningful in relation to those hand gestures.

In Example 2 her use of speech (" just slide that one in laterally") becomes more precise, describing a movement and a direction, whilst a pointing gesture indicates which of the two retractors to use for making that movement. In Example 3 speech is not used at all. Here the trainee signals to the trainer, through self-initiated positioning of the retractor, that he feels he is capable of doing so. This is then followed by an evaluation of the trainer ("Yeah, brilliant"; "yeah perfect").
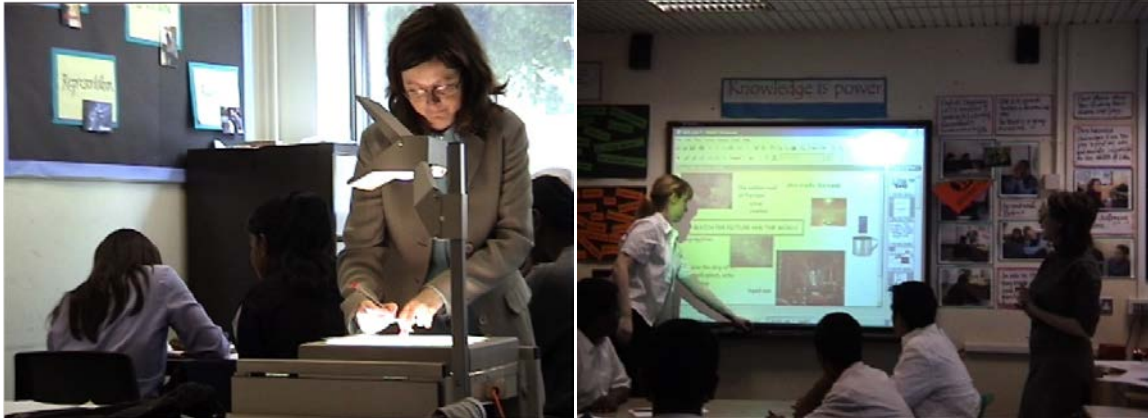
The control over the positioning of the retractors shifted in the course of the 14 minutes of dissection. We identified 22 instances of (re)positioning. In the first half, control lay mostly with the trainer as she positions the retractor herself in 13 out of 14 cases. In the second half, control was mostly shared by the trainer and trainee, with the trainer telling and pointing out where to (re)position the retractor which is handled by the trainee. In the second half of the operation the trainee also (re)positioned the retractor himself for the first time, on two occasions.

These changes can be taken as signs of learning: At first the trainer acts as a model, suggesting to the trainee how, where and when she positions the retractors. The trainee then begins to position the retractors himself, demonstrating that he has 'picked up' what is required in this context. Thus we can see how 'designs for' and 'signs of' learning are intertwined in interaction, with the teacher giving prompts in different modes and the learner displaying responses to these prompts.

4. Historical comparisons of multimodal designs for learning

So far we have analyzed multimodal designs for and signs of learning produced by individual educators and learners on a particular occasion. In this section the focus is on changes in the semiotic, social and technological landscape. Multimodal social semiotics often makes historical comparisons to investigate how new technologies reshape the resources available to meaning makers. For instance, early printing technologies limited the kind, placing and number of images in textbooks, yet now not only do there seem to be more images than before, they often seem to dominate the page. In a different set of media, the shift from the blackboard to the interactive whiteboard has led to an increase in the use of visual means for the presentation of science and other subjects. Concerns have been expressed about such changes in the semiotic landscape, about the increased use of images for instance, and their implications for learning. To some commentators this threatens literacy, must lead to a general 'dumbing down', and is bound to have deleterious effects on economic performance. Less prominent, if equally firmly expressed, are beliefs in the empowering potential of such changes by their offering new routes into existing curriculum topics. Multimodal social semiotics can contribute to this debate by identifying what might be lost but also what might be gained from changes in the semiotic landscape.

The examples are of secondary school classrooms in England, and the subject taught is English. One example is from data collected in 2000 (Figure 8), and the other example is from the same classroom, involving the same teacher, again teaching poetry, but to a different class, recorded in 2006 (Figure 9). In the earlier lesson the teacher was using an Overhead Projector (OHP); in the more recent lesson she was using an Interactive Whiteboard (IWB). The curricular categories in both lessons were constant: 'poetry and 'persuasive language'. In the meantime, however, there had been significant changes in the landscape of school English with respect to the pedagogic organisation of the classroom and the 'performance' of the roles of the participants, the display of texts, and the process of textual analysis, each of which is described and discussed below.

Figure 8: An English classroom in 2000   Figure 9: An English classroom in 2006

A rhetoric of 'democratisation' is suggested by the contrast, over that period, in the display and function of student texts in the classroom. In the lesson from 2000, canonical English texts and teacher-made typed, laminated and framed texts were displayed on the front and sidewalls of the classroom, with some student texts displayed on the back wall. In 2005, student-made texts were digitally incorporated into the active pedagogic space of the classroom.

The teacher scanned student responses to the poem, including students' own poems, and displayed these immediately on the Interactive Whiteboard (IWB). The student texts displayed on the IWB became objects for discussion that both the teacher and fellow students manipulated and annotated. A shared, malleable text was created that opened up new pedagogic possibilities that could affect the configuration of authorship and authority in the classroom. The teacher's annotation and marking of the student texts on the IWB has transformed what had been, usually, a semi-private activity into a public one. This makes both the criteria and the process for assessment explicit.

The sense of what can and needs to be displayed has changed in the time between the two lessons, as have the technologies of display. In 2000, writing and speech were in the foreground; by 2005, however, image, colour and layout have, alongside writing, become central to the pedagogic resources of the classroom. The changing semiotic landscape of the classroom has an effect on the curriculum and the pedagogic function of texts – what texts are presented, how texts are presented, and what can be done with them. In the lesson from 2000, the use of the OHP supported the display of the written poem with line numbers, as a photocopy from a book. By 2005, the poem had become integrated with images downloaded from the Internet across several slides of a teacher-made PowerPoint.

More generally, comparison of the two data-sets, and observations of school English in 2009, suggest that changes in the relationship between image, speech and writing have been extended and embedded in the English classroom. It is now common for English teachers (although there are likely to be generational differences in this) to show a clip of digital video (often via Youtube) or to display an image – often downloaded from the Internet – to offer a route into a 'concept'. Teachers frequently use PowerPoint presentations to present their argument, they annotate texts visually or they connect to a webpage. The use of image is also prevalent in students' work in English, with the use of clipart, digital photographs – taken by students or downloaded from the Internet – designed as PowerPoint presentations and project work, both in class and out of school for homework.

This has begun to reshape the work of the teacher and the student. The 'contemporary teacher' is involved in the pedagogic design of digital multimodal texts that were rarely seen in 2000. The student analysis of written 'imagery' in poems is now often (re-)mediated by actual images – indeed in this classroom the teacher began the discussion of 'concepts' by showing images downloaded from the internet. What is to be learned and how it is to be learned is being reshaped by the multimodal potentials of digital technologies used by teacher and student uses.

This prompts the question: what are the social and educational implications – the gains and losses of this process?

One significant difference for textual analysis is that the starting point for the introduction and the analysis of the poems is different. This difference appears to be underpinned by changes in the use and function of writing, speech and image in the classroom. The starting point for textual analysis in the lesson from 2000 was provided by a whole-class discussion of the poem's title and the students' use of the dictionary to 'look up' words in the title (and in the rest of the poem). The dictionary was the irrefutable, taken for granted reference point and authority. In 2005, the starting point for textual analysis lesson was a whole-class discussion of the image accompanying the poem displayed on the IWB and 'brainstorming activity' engaged in by the whole-class. The role of the dictionary in textual analysis had changed, from its central position in the 2000. Indeed, where in 2000 there were two or three copies of the larger Oxford English Dictionary on every table, by 2005 there was no copy of the dictionary in the classroom. By 2005, the meaning of words had become 'anchored' and defined through images downloaded from the Internet that the student were asked to match to words in the poem, such as 'congregation'.

Our comparison suggests a broad move towards 'capturing' and displaying the work and opinions of students: a move from talk as ephemeral to the concretised display of talk. In 2000 there was a firmer boundary between the work of reading the poem and of analysing the poem than is the case in 2005. In 2000, the poem was read aloud twice before analysis for meaning began; in 2005 analysis for meaning begins with an engagement with the image before the written text of the poem is even introduced. The potentials for meaning made possible by changes in the socio-technological environment of the classroom raise quite new possibilities for decisions for teachers and students, with far-reaching implications for curriculum and pedagogy, and student identities.

5. Implications: 'Teaching', 'competence' and 'canonicity'

To conclude this paper we discuss some of the wider implications of a multimodal social semiotic approach to researching learning. Three terms are in focus here: 'teaching' (which relates back to Section 2 on multimodal designs for learning), 'competence' (which relates back to Section 3 on signs of learning) and 'canonicity' (relating back to Section 4 on historical changes).

'Teaching'
'Teaching' is often defined as 'making explicit' the 'unspoken', 'practical' knowledge of experts. The examples discussed in Section 2 show that explication is not the exclusive domain of the modes of speech and writing. Indeed, in many contexts, image, or gesture, are modes better suited to 'make explicit', or even the only modes available to make anything explicit at all. Thus we see educators using different modes in different contexts to make explicit what needs to be learnt. For instance, in writing and speech science educators can express the processes involved in digestion exceedingly well, but when the forces involved in magnets are discussed in the classroom gesture becomes the preferred route to knowing. Multimodal social semiotics, in turn, aims to document all of these forms of explications so as to provide an inclusive picture of learning across different sites. The historical comparison in Section 4 also pointed to social and technological changes within one particular site, the classroom, and its effects on the role of the educator. While there has at times been some concern that digital technologies might do away with the central role of the teacher, the implication of the analysis here is rather different. It suggests that the role of the teacher, far from being 'de-professionalized', is becoming one of the teacher as rhetor and designer of different sites as maximally effective environments for learning.

'Competence'
The examples presented in Section 3 suggest that we can potentially recognize signs of learning in any mode, or combination of modes, on any timescale, and in any site. At the moment, only a small selection of these is recognized in assessments. We acknowledge that cultures and societies do recognize these signs to different degrees, privileging one above the other, or treating one as 'richer', 'better' than the other (for instance, in 'mainstream' secondary school curricula in the Western world writing skills take precedence over drawing skills).

Multimodal social semiotics assumes that power relations are manifest in all forms of recognition; yet rather than establishing an opposing hierarchy of valuation, it sets out to investigate how people use and continue to develop modes of communication in response to social and cultural demands. Thus, a multimodal perspective draws attention to that which is not (yet) 'curricularized'. For instance, part of learning is understanding the apt resources to bring to bear in a given context to make meanings and then to express meaning: on one occasion a verbal response to the teacher is expected, on another, learners are expected to display their engagement through modes other than speech – gaze and posture, for instance. This holds true for all meaning-makers we observed, whether as teachers and learners in schools or as an experienced professional teaching a relatively inexperienced member of a profession at work.

The changing semiotic landscape also poses new questions about what is learnt. For instance, where up to two decades ago maybe, competence in relation to one mode, writing ('literacy'), was seen as sufficient for the task of composition of text, we now need to understand the semiotic potentials of all modes involved in text making. Now, when text consists of image and writing say, specific forms of textual cohesion and coherence emerge and theoretical means are needed for making sense of these. Where previously grooved routines of convention could serve as reliable guides in composition, in a multimodal world there is a need to assess on each occasion of text-making what the social relations with an audience are, what resources there are for making the text, what media are going to be used, and how these fit with what is to be communicated and with a clear understanding of the characteristics of the audience.

'Canonicity'
One of the semiotic changes we identified in Section 4 is the shifting relationship between image and writing in designs for learning. The visual is no longer – if indeed it ever was – an illustrative adjunct to word; images are used fully in representation; they are integrated in multimodal ensembles. This move speaks of the need to make curriculum knowledge "relevant" by connecting with students' out-of-school experience; the desire to increase student "engagement" through "interactivity"; as well as the pressures of examination and the promise of 'pace', 'speed'. Increasingly, images now provide the starting point for an English lesson.

This has far-reaching effects for learning: through the texts that come into the classroom, how they are mobilized, how they circulate and are inserted into social interactions. This changes the place, the functions and uses of image, writing and speech. The boundaries between canonical texts and the texts of the everyday, of the aesthetically and historically valued, of the mundane and the canonical are changed. These changes mark the social and political boundaries of English – determined by teachers, schools, Local Education Authorities, by policy and by diverse social interests – boundaries hitherto tightly guarded and regulated by a highly prescriptive policy context. Drawing texts from the Internet (for example, from image banks or Youtube) connects English with the experiences and technologies of the 'out-of-school' in ways that question the boundaries of canonical knowledge and what counts as socially valued. This changes the semiotic landscape of the English classroom, even though these changes vary across an uneven social terrain.

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Further reading

References to publications on the examples used in this paper are given in the acknowledgements section above. For general introductions to multimodal social semiotics (i..e. not focused on learning per se), please see Hodge & Kress, 1988; Kress & van Leeuwen, 2001; van Leeuwen, 2004; Kress, 2010. For introductions to multimodal methods in social semiotics, please see Bezemer & Jewitt, 2010. For a general overview of multimodal research on learning (i.e. not only social semiotic studies), see Jewitt, 2008. For a general overview of multimodal research, please see Jewitt, 2009.

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