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Using a beginning history teacher's consideration of students' prior knowledge in a single lesson case study to reframe discussion of historical knowledge

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Abstract

Using the philosophy of inferentialism (Brandom, 2000), this article explores teachers' approach to students' conceptual development, arguing that asking what it is for a concept to have meaning affords new ways of framing both instructional design and explanations of variation in student learning. Through an inductive research strategy into a single lesson taught by a student-teacher, I show how semantic theory can help educators to discern and harness student knowledge building.

Key words

History Education; Teacher Training; Beginning History Teachers; Historical Knowledge

El uso de la concepción de los docentes de historia principiantes sobre el conocimiento previo de los estudiantes en una lección de estudio de caso para replantear la discusión del conocimiento histórico

Resumen

Utilizando la filosofía del inferencialismo (Brandom, 2000), este artículo explora el enfoque de los profesores para el desarrollo conceptual de los estudiantes, argumentando que preguntar qué significa un concepto ofrece nuevas formas de enmarcar tanto el diseño

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instruccional como las explicaciones de la variación en el aprendizaje del estudiante. A través de una estrategia de investigación inductiva en una sola lección enseñada por un estudiante-maestro, se muestra cómo la teoría semántica puede ayudar a los educadores a discernir y aprovechar la construcción de conocimiento de los estudiantes.

Palabras clave

Enseñanza de la historia; Formación del profesorado; Docentes de historia principiantes; Conocimiento histórico

Introduction

Conceptual development is a process that involves students coming to think of objects and events in fundamentally different ways from those they start with. Teachers contribute to students' conceptual development through their instructional design. The history education community in England and internationally has given considerable thought to what particular concepts mean, or to what type of a concept something might be, or to which activities might facilitate students' learning of particular concepts (Counsell, 2011; Counsell, Burn, & Chapman, 2016). These interests are informed by a rich seam of research demonstrating how students' new learning is in part determined by their existing knowledge and how a *disciplinary* understanding of history's domain-specific heuristics and processes differs from *everyday* notions of the past (Wineburg, 2001, 2007; Donovan & Bransford, 2005; Lee, 2005, 2014; Lee & Ashby, 2001). What the history education community has not given equivalent thought to, however, is *what it is for a concept to have meaning in the first place*. This failure to problematize the symbolic nature of concepts may, I suggest, seriously impede history teachers' attempts to support their students' conceptual development.

Recent developments in philosophy explore the question of what concepts are and how they change. Derry (2008; Bakker & Derry, 2011) has broken new ground in examining the educational implications of these developments, specifically the work of Brandom on *inferentialism*, which gives us a new language and a new perspective with which to scrutinise common approaches to instructional design, advancing the argument that teachers cannot work to develop students' conceptual knowledge-building to full effect if they overlook the relationship between representation and its content.

For the inferentialist, words relate to the world; that is, they come to have meaning through a particular form of doing, expressed as reasoning. Taking the example of the simple sentence, 'It is red.' Brandom (2000:162) says,

The knower has the practical know how to situate that response in a network of inferential relations – to tell what follows from something being red..., what would be evidence for it, what would be incompatible

with it, and so on. For the knower, taking something to be red... is making a move in the game of giving and asking for reasons – a move that can justify other moves, be justified by still other moves, and that closes off or precludes still other moves.

For an inferentialist, keeping track of these entailment and incompatibility relations is what understanding language means. Representation of *world* by *word* arises from the 'if... then' inferential reasoning which situates concepts within their consequential relations to other concepts, and which relates the integrity of these inferential bonds back to the world through the normative *entitlements* they bestow in interaction (Brandom, 2000). Inferentialism opens new ground in thinking about the nature of cognitive content by explaining how propositional contents and, in particular, how objective meanings are constituted in social practices of what Brandom (2000) terms 'giving and asking for reasons'. Rather than imagine that educationalists teach words by pointing to something in the world that those words are thought to represent and then seeing how students use those words, the inferentialist notices how recognising a word involves a particular kind of responsiveness and reasoning in the first place. Appreciating words as symbols for something, opens a two-part question: what are words standing in for and how are they doing it?

The problematization of the relationship between concept and its content matters because students' academic success relies on their grasp of symbols and their constitutive meaning. An irony of formal education is that responsibility for students' conceptual development rests with those who have linguistic proficiency. That very proficiency makes it difficult for teachers to appreciate how little particular symbols actually symbolise for the many students who are left behind their academically successful peers. To treat words and their referents as the same things, or as related through simple equivalence in a labelling action, is to risk attributing more meaning to individuals' word use than actually exists and to mistake sharing the same words with sharing the same knowledge. While concepts' referents in history rarely relate to discrete physical objects, they are nevertheless symbolic of something no less real. My experience of 'cause' might not have taste or smell but my word cause is symbolising my encounter with 'cause'. It is representing the inferential reasoning of consequential relations arising in response to a world of causes. Expecting students to relate to symbols, with only the shallowest of relations to the symbolised, is problematic. If students are to recognise what history's words refer to, the words' referents need to resonate; that entails an adequate and relevant reasoning experience, grappling with the world from which students come to forge words' meanings. History students' exposure to history's words without what we could term adequate corresponding '*referent resonance*' through '*relevant inferential reasoning*' cripples genuine historical understanding.

What would teachers' instructional design (and the resultant student progress) and teacher educators' preparatory courses look like if they were modelled on a theory of conceptual meaning which required '*referent resonance*' constituted by '*relevant inferential reasoning*' rather than a simple word to world correspondence? The task of providing concrete examples and working through inferentialism's implications is relatively recent

and there is much work to be done. This article reports just one case study within a more extensive exploration of the potential impact of these theoretical innovations on the way in which teachers might think about concepts in history education.

The research (conducted with six different history teachers – some novices and some experts) focused on each teacher's instructional design choices within specific lessons as a way of exploring their approach to conceptual development. I was interested in the teachers' *'content-activity pairings'*: a term I use to refer to the relationship between the input or content of specific lesson segments (which might be conveyed in various forms, such as through written text, teacher exposition or video) and the activity associated with them, such as reading to compare, or listening to summarise, and so on. My exploration of the teachers' instructional design as expressed in their content-activity pairings within and across lessons, was framed by the following considerations:

- (i) What capabilities do students need in order to access the lesson's content-activity pairings, (i.e. how well does the lesson align with students' existing knowledge); and
- (ii) How conducive is each content-activity pairing to generating the kinds of learning that is intended (i.e. how well is the lesson aligned with the target knowledge to be developed)?

This paper reports on the first of these considerations in the case of a single novice history teacher, Sarah. The lesson was taught to a class of 27 girls aged 11-12 in an inner-London state comprehensive school. I drew upon an inductive research strategy for the purposes of describing patterns drawn from the data generated which included Sarah's own words from the pre and post-lesson interview transcript, quotations from the lesson resources, and students' written responses. I have selected this case because of the misalignment that it reveals between the content-activity pairings and the students' prior knowledge: a misalignment that prevented the students from achieving the teacher's learning objectives. While other teachers' lessons had much less ambitious objectives and did not depend on students' familiarity with particular disciplinary heuristics for them to access the learning; this novice's plan relied on the assumption that students would already understand particular kinds of historical syntax. Sarah's challenge went beyond struggling to appraise students' existing knowledge accurately; she seemed to lack adequate awareness both of *what* prior knowledge students needed given her content-activity pairings and objectives, and of the significance of an analysis of prior and required knowledge for her students' learning and her instructional design. I discuss the nature of students' conceptions in this case study and how semantic theories shed light on how beginning teachers need to learn to determine and harness students' prior knowledge in their instructional design.

Current Framing

The classificatory framing of knowledge in history education in England is well developed. Following Bruner (1996) and Hirst's (1974) description of disciplinary knowledge as having both 'body and form', history educationalists have explored different 'types' of knowledge (Lee & Shemilt, 2003; Counsell, Burn, & Chapman, 2016; Lee, 2014). A *body* of knowledge

about the past is commonly referred to as *first-order* knowledge. There are also disciplinary conventions giving *form* to how an academic community of practice goes about asking and answering questions about the past, known as *second-order* concepts. They include the heuristics and methods used by historians, such as assigning causes or discerning patterns of change, and meta-historical questions about how people treat the past. For example, if the reader thinks that one author must be mistaken if two accounts provide differing dates for the fall of the Roman Empire, then the reader seems to be approaching the problem with a sense that there is a single correct date for the event and the historian's role is to discover and report it honestly (Lee, 2005). Here, the first-order knowledge refers to the fall of the Roman Empire and the second-order knowledge to the reader's understanding of how historical accounts are written. A more mature second-order understanding would see the possibility of varying accounts as the natural outcome of authors taking different markers for what constitutes collapse.

Shemilt (1980:26) captures a principle underpinning this 'body and form' conceptualisation of historical knowledge:

Whilst children can be more or less well informed about the conclusions of expert enquiries into the past, they are only educated to the extent that they possess understanding of the methods, logic and perspectives proper to these enquiries.

The influence of this watershed distinction between 'body and form' was first felt in mainstream UK history classrooms in the 1970s. Proponents characterise this change as allowing learning to be about more than the extent to which students memorise and reproduce other peoples' knowledge of the past (body). The maturation of students' disciplinary heuristics and methodological practice became important for historical learning (Kitson et al 2011: 44-52). As practitioner literature (Counsell, Burn, & Chapman, 2016) and iterations of the National Curriculum for England attest, attention turned to specifying history's syntactical concepts and exploring how teachers might teach this disciplinary syntax while teaching substantive content.

The research noted above, demonstrates how learning history entails more than the accumulation of substantive concepts. Most proponents of teaching history's 'body and form', however, would acknowledge that while essential, this categorisation is an incomplete theorisation whose silences and ambiguities can be evidenced in numerous ways. One way is to look to how these intellectual categories are often mistakenly mapped onto naïve polarities, posing constructive against transmissive pedagogies or separating curricular concerns into those relating to knowledge (first-order substantive content) or skills (second-order syntactical rules) (Counsell, 2000; Cain & Chapman, 2011). The resultant quest to explore what learning strategies work or what knowledge types matter has detracted attention from asking *what is it* for our concepts to have meaning.

Another way to see the limitations of the current theorisation is to look to leading quasi-experimental research, which reports important caveats to the partial gains in students' historical thinking resulting from the 'treatment' conditions under investigation. Students improved in their knowledge *about* historical reasoning but not actually in their own historical reasoning. Shemilt (1980: 10-11) concluded,

Adolescents gained considerable insight into what the historian means by such ideas as ‘causation’, ‘development’ and ‘change’; but they could not, ..., produce more coherent prose;

Seeking to develop causal historical reasoning concerning the outbreak of the First World War conducted in an implicit and explicit condition, Stoel, Van Drie, and Van Boxtel (2014: 1) reported,

... first-order knowledge increased in both conditions, but students in the explicit condition acquired significantly more knowledge of second-order concepts and causal strategies. However, no differences were found in students’ written explanations.

In Reisman’s (2012: 86) ‘document-based history curriculum intervention’ students improved in two measures of historical thinking: *sourcing* and *close reading*, described as reflective of ‘discrete concrete actions such as immediately bringing one’s eyes to the source note at the bottom of a page, or underlining vivid language’ (2012: 104) but not *contextualisation* and *corroboration* which Reisman concludes might be, ‘more sophisticated’ requiring intertextual strategies and might, ‘depend on a deeper epistemological understanding of the discipline, rather than mastery of discrete behaviours.’ (2012: 104).

How can educationalists take the development of second-order concepts as the object of their instructional design while their students continue to make only marginal gains in their use of maturing second-order concepts? An important possibility is that being versed in the workings of second-order concepts is not the same as being able to put them to work. When educationalists take knowledge as the object of study we hold it flat, pinning it down as an artificially abstracted snapshot of what is in actuality an integrated and animated knowledge deployment in the knowers’ thinking. Rightly so; it would be a poorly articulated curriculum that failed to clarify *what* it is aiming to teach. The research described, however, suggests that propositions that name historians’ heuristics, so knowledge ‘of’ second-order concepts and their workings, do not adequately encapsulate the operation of these heuristics in students’ first personal experiences of historical reasoning, that is, ‘as’ historical thinkers. The danger is a reification of knowledge where the words become decoupled from sufficiently robust reasoning. While we know historical knowledge entails both first- and second-order concepts, for the purposes of teaching, this characterisation does not get at the nature of concepts and their functioning and teachers are often left wondering why students are not using the concepts teachers believe they have taught.

Re-framing Current Discussion

In order to draw out the implications of inferentialism for instructional design it is helpful to make a clear distinction between the subject who knows, that is, who engages in an animated and fluid knowing, termed the *knowing-subject*, and the object of knowledge or what is to be learned, identified as the *object-knowledge*.

Obviously the *object-knowledge* varies from one lesson segment to another. On one occasion it might be a series of facts woven into typical accounts of the past; on another

methods of historical investigation; on another the mental models that inform how historians see both the past and their investigation of it. Object-knowledge refers to the teacher's main focus for learning when making that content-activity pairing selection. It is not a description of the internal learning process, nor does it encompass all the possible learning that might occur within the content-activity pairing. According to Michel-Rolph Trouillot (1995) history is made by 'doers' (such as Alexander the Great or Marie Curie) and 'tellers' (such as Herodotus or Mary Beard). We could therefore say, as in Table 1, that historical knowledge pertains to four types: knowledge 'of' doers and knowledge 'of' tellers (students' knowledge 'of' people and worlds from the past and of historians' heuristics and methodologies for understanding the past); and knowledge 'as' doers and knowledge as tellers (students' knowledge 'as' historical actors and 'as' historians).

Table 1.

Types of Knowledge-object Determined by the Teacher's Purpose

	Knowledge 'of'	Knowledge 'as'
History's doers	<p><i>Content- activity pairing:</i> Read a chapter to make a timeline of events during the French Revolution.</p> <p><i>Knowledge-object:</i> Knowledge of key events (in chronological order)</p>	<p><i>Content- activity pairing:</i> Participate in a simulation which recreates the circumstances and decisions of parishioners during the English Reformation.</p> <p><i>Knowledge-object:</i> Empathetic understanding of ways of thinking in particular circumstances</p>
History's tellers	<p><i>Content- activity pairing:</i> Contrast two historians' accounts of the British Empire.</p> <p><i>Knowledge-object:</i> Knowledge of specific similarities and differences between historians' claims.</p>	<p><i>Content- activity pairing:</i> Use the information cards to explain why Hitler became German Chancellor.</p> <p><i>Knowledge-object:</i> Construction of a causal explanation</p>

While the particular examples included in the 'Knowledge as' are both concerned with specifically historical kinds of knowledge, teachers often seek to develop this kind of knowledge-object by using everyday parallels within students' own experience. The four part categorisation is not an exhaustive list of either the potential or actual learning that could come from the content-activity pairing but a description of the teacher's dominant intention about *what* ought to be learned. It is possible for a teacher to have two or more intentions for a particular content-activity pairing simultaneously.

Knowing-subject relates to the ‘who’ in learning, and refers to the knower’s mind, about which others can only speculate using knowledge manifestations, that is, the symbolic proxies for *knowing*, typically oral and written artefacts – i.e. words.

This subject/object distinction is helpful because the ‘body and form’ categorisations may create the false impression of two types of conceptual knowing to match the two types of conceptual knowledge (body and form). While it makes sense to categorise the object of our teaching or learning into types, from an inferentialist informed perspective, our concepts, understood as symbols, are constituted by a reasoning activity, a *knowing* characterised earlier as ‘*a ruling in and out*’ of entailments and incompatibilities, regardless of our characterisation of concepts into substantive or syntactical types. This insight yields rich discussion. Two implications pertinent to the novice teacher’s lesson explored in this paper include:

1. the importance of discerning what students’ existing concepts mean to them i.e. what ‘if...then’ commitments they involve, and the salience of this for content-activity pairings beyond a ‘body and form’ theorisation;
2. the implications of how all concepts are constituted of and through the same inferential reasoning which depends on ‘*referent-resonance*’.

Sarah’s Lesson

Sarah wanted her students to understand how the Peasants’ Revolt was caused by the long-term consequences of the Black Death and not simply by peasants’ immediate grievances. She describes her objectives during the pre-lesson interview,

So I want them to be ... looking at the revolt and linking it back to the Black Death, so seeing how peasants at that particular time felt that they were able to revolt. Rather than focusing on Wat Tyler or the causation of what led to that event, I want them to be considering the wider picture of peasants’ situations before the plague and why particularly now they feel that it’s necessary to revolt.

Her lesson is summarized in Table 2.

Table 2.

Lesson Summary

Lesson Objectives:

1. ‘Describe the reasons why the peasants revolted’
2. ‘Explain why the peasants thought they would be successful’.
3. ‘Evaluate why they hadn’t revolted before’.

Lesson Content-activity pairings:

-Whole-class question and answer starter to facilitate student recall of peasant and baron power relations after the Black Death.

- A three-question worksheet accompanying a three-source information sheet which students completed individually after Sarah modelled the process of summarising an answer found in a source.

Worksheet Questions:

1. 'What decisions led to the peasants thinking they had had enough? (Why was this different to before the plague?)'
2. 'Why did the peasants think they could get more money for their work?'
3. 'Why did peasants feel that they had deserved more now? (Think about how attitudes may have changed too!).'

- Written exercise to answer one of three further possible questions based on the objectives and worksheet questions and intended to correspond to students' existing attainment levels.

Most lesson time was devoted to the worksheet discussed below.

Objective 1 / Worksheet Question 1

Sarah's worksheet began by asking students to '*describe*' immediate 14th-century peasant grievances prior to the Peasants' Revolt, framed as provocations - 'decisions' driving peasants to conclude that 'they had had enough'. Students directly copied phrases from individual sources such as, 'Peasants were not permitted to ask for better conditions' and 'The poll taxes were levied'.

Objective 2 / Worksheet Question 2

Sarah intended students to explain not why peasants wanted better wages but why they had reason to believe they would be successful in getting them.

So that is really drawing out that thinking of the fact that they have been successful in gaining more money previously, em, that that is quite a significant change

Students' re-deployed their 'locate and record' strategy, copying phrases such as, 'Peasants are working so much harder since the Black Death', and 'There is no one else to do the work'. This information could be pertinent to constructing the causal claims that Sarah intended, but students scoured the text and offered these quotations as reasons that peasants could argue that they *deserved* more, not as evidence of peasants' evolving thinking patterns, born from an underlying change in circumstances. Students continued with their existing causal heuristic uninterrupted.

Unlike Sarah's modelled example and Question 1, Question 2 requires students to see causation and handle sources differently, a subtle but significant shift that went unacknowledged and without accommodation. Students needed to:

- propose interplay between circumstances peculiar to the post-Black Death situation and peasants' reasoning, not reduce explanation to the identification of peoples' immediate justifications for action
- cross-reference and contextualise sources to generate historical inference, not repeat source-writer testimony.

Objective 3 / Worksheet Question 3

Sarah describes wanting students to move beyond the unfairness of discrete grievances or that better conditions were warranted or likely within the context. She wanted students to imagine a broader collective attitudinal shift, to see how the Black Death had revealed that the social structure itself was unjust rather than being divine architecture. As with the modelled answer, and previous questions, students merely lifted immediate, discrete grievances from the text.

Sarah's Instructional Design Thinking

When prompted, Sarah explained how she conceived of the questions' increasing challenge,

I know that's sort of, that's a bit of a jump, but I think that will be the thinking involved for the students rather than just pulling it from a source which in itself is a skill, to actually use it for something slightly different. Em, and then for the evaluate, again that's students really starting to be a bit more independent in their own thoughts, so they are evaluating the situation to really recognise that the cause of all of this is the plague and the fact that em, peasants' attitude has changed...

From a 'body and form' model of historical knowledge Sarah is aware of more sophisticated ways of working with sources and of explaining why things happen in history but she has a limited sense of how to induct students into realising these stronger insights. The failure to problematize conceptual change is echoed in Sarah's description of what students would 'do', or 'draw out' not what they will *learn* to do. It is as if Sarah were saying, 'You can do these things with this content so that's what I want you to be doing. You will be seeing the complex explanatory scenario I can see.' Her contribution has been twofold: the careful selection of content rich enough to carry that complex scenario; and the precise crafting of her worksheet questions. Sarah knows what 'better' looks like in historical thinking but her instructional design lacks a path beyond it being possible for someone with the correct knowledge base to be able to make these deductions from the material provided.

Why are students not 'drawing out' what can be drawn out from the material? Conceptual development can be seen as a change in existing networks of implicit inferential bonds. It depends on knowing the students' starting points and how mental movement 'from' and 'to' different meanings occurs. It is not the clear articulation of what is to be learned or recurring opportunities to do what one cannot do.

Starting Points

The challenge of assessing the quality of knowing is much greater than is often imagined. The research noted previously demonstrates how, when statements and questions do not make sense in terms of existing concepts, they are often ignored or distorted to fit existing understanding. For inferentialists, words are 'markers' or proxies to help teachers determine students' meanings. Sarah builds no 'detecting' of existing knowledge into her instructional design beyond reminding students of peasant-baron power relations. What matters for inferentialists is a disposition to unpick the very different meanings that lie behind what appear as very similar sentences, and how our words alone, without adequate 'referent resonance' entailing 'relevant reasoning', may only serve as symbols for very shallow meaning.

How Movement Occurs

Given students' responses it is clear that their existing conceptions clouded their possible causal arrangements and prevented them from 'reading' the sources as Sarah intended. It is unclear if Sarah envisaged the content-activity pairings as demanding the demonstration of prior syntactical understanding or if she were hoping this material would somehow spark the re-framing of students' existing concepts. If the items you profess to be helping students to acquire as a result of your content-activity pairing are actually pre-requisites for their participation or entry into the content-activity pairing then could the content-activity pairings be described as disingenuous invitations? There is no reason to think that exposure to the existence of stronger conceptualisations necessarily builds stronger conceptualisations for every, or most, students and the current 'body and form' theorisation of knowledge is silent on this issue. When and under what conditions is the chance for students to do or think what they cannot do or think a helpful learning strategy enabling them to develop new understanding, and when is it not? What matters from an inferentially-informed perspective is how students are exposed to stronger conceptualisations, not simply that they are exposed to stronger substantive and syntactical conceptualisations.

How Would an Inferentially Informed Perspective Differ?

Using the distinction between knowing-subject and object-knowledge with its four-part model (Table 1), I discuss the critical role of 'discerning' students' meaning and the nuanced options for instructional design. I illustrate this discussion with a syntactical and a substantive-based example.

Sarah explained,

so the intention is **not** for them to think about what would I do or what would a *peasant* do, using what they have looked at from the last lesson, I want them to be considering what options I suppose barons and peasants have *after the plague*, so that they are using that knowledge to really create a scenario ... in their head..., so their considerations should really be coming round to the plague being a really big cause

In terms of the four-part *object-knowledge* classification in Table 1, Sarah saw students as needing knowledge 'of' doers, for example, of labour shortages and taxes, but she did not

want to focus on creating student knowledge ‘as’ doers, for example, by using simulation to promote students’ consideration of historical agents’ world from the inside out. Sarah’s instructional design emphasises students ‘as’ tellers. Like historians, students would create a temporally-sensitive explanatory scenario, accounting for the ways historical agents’ intentions are mediated and curtailed by their long and short-term context.

Implication 1: The Importance of Discerning Students’ Meaning Given the Importance of Referent Resonance Entailing Relevant Reasoning, a Syntactical Example

Rather than assuming that students already have, or can get, historians’ meaning because they understand the words historians use, inferentialism suggests that teachers need to discern the implicit inferential bonds constituting students’ meaning of those words, to make students’ entailments and incompatibilities **explicit** in real time. The wording of Sarah’s question, ‘Why did the peasants think they could get more money for their work?’ is correct in relation to her objective ‘Explain why the peasants thought they would be successful’. The meaning that students’ attributed to these words was not ‘how did the circumstances affect how peasants thought about their chances?’ but ‘what did peasants want’. Rather than settling so cheaply for the words, the inferentialist wants to hold the learner to account for what follows from their application of a concept and what it follows from. It is only in the inferentially-related antecedents and consequents of the assertion that we see the differences in meaning lying behind the same statements; differences that are masked by a correspondence theory of meaning.

Sarah needed to discern students’ starting points in a more time-effective way. In order to better compel ‘relevant reasoning’ and prevent students from sleepwalking through the question, they needed to appreciate a shift in ‘referent resonance’ from peasant motivations to how changing circumstances could inform peasant rationale; that is, the way peasants would be calculating their chances.

The transition away from justifications and into peasants’ evolving understanding of their changing context could have been supported through student construction of a well-annotated timeline. Fundamentally, however, Sarah needed a ‘discerner’ question to uncover the occurrence and range of student thinking about what makes events more or less likely. Sarah needed to know if students were in the right ‘space of reasons’ and how they were operating in that space. Asking them to explain what chance *they* would give peasants of getting their way and why, could have served this purpose rather than asking them ‘Why did the peasants think they could get more money for their work?’. Sarah needed to check whether students were just repeating agents’ motivations, or if they were looking to how the circumstances influenced the likelihood of particular outcomes.

If she had realised the need to craft space for alternative meanings by investing in more concrete referent resonance, Sarah could have explored how students ‘calculate’ every-day expectations of success. Students could have shared occasions when they felt the effects of their own track-record on their determinations of pending success or failure. Sarah could have drawn upon students’ knowledge ‘as’ doers to create parallels for comparison when students transitioned back into knowledge ‘as’ tellers.

If students’ implicit inferential relations when asked initially about their reckoning of peasant chances were sufficient, then Sarah could have forgone the everyday examples

and asked the more remote question of 'Why did the peasants think they could get more money for their work?' Perhaps then students would have been ready to see that the same sentences they took as expressing immediate justifications could have been read as suggesting a changing rationale based on circumstances. For example, that if they had already received something once they were more likely to get it again because the precedent is set, or that they are more likely to get it again if the dynamics from which it originated have not changed; barons still needed labour for food.

Like the 'body and form' theorisation, inferentially-informed instructional design relies on teacher discernment of which existing student conceptual meanings can be built upon, which are missing, and which are blocking the intended learning. It differs in that choices are predicated upon understanding words' meaning as a form of reasoning entailing referents that resonate, not on knowledge broken into concept types.

Implication 2: The Importance of Seeing How All Concepts Are Constituted of and Through Relevant Inferential Reasoning Entailing Referent Resonance – a Substantive Example

Sarah describes her struggle to help students understand that 'Medieval people depended upon the land', which, had she known how to resolve it, might have furthered her 'as teller' objectives.

One of the key things that students have been struggling with is actually the kind of key food chain in understanding that land is linked to food and everyone's survival. So we've been drumming that in quite a lot over the last few lessons, but I don't know if everyone is really with me, so really understanding that the harvest isn't just about making money, it's actually about people living and that as much as the barons want to be wealthy, they actually also want to survive.

I think it's such an alien concept to children who have grown up in a city where food comes from the shops...

Well what do the peasants get out of it, why don't they just move, and then sort of, in that conversation of saying they can't move because they are tied to the land because they need it to survive, students were puzzled and saying why....

Fragmented knowledge 'types' can lead teachers to miss how an instructional design focus in one category of *object-knowledge* could in fact lead to gains in another. For example Sarah's students could have benefited from a stronger 'doer' focus in order to achieve a stronger 'teller' outcome. Above, I suggested a focus of knowledge 'as-doer' today; here, an alternative comes from lingering upon knowledge 'of-doers' at the time.

In the right conditions, really understanding how peasants and barons were tied to the land entails an enormous mental feat and takes students a long way to understanding how agency and circumstance intertwine in causal explanation. The reason students can understand the sentence, 'Medieval people depended upon their harvests.' and still be genuinely bemused that the peasants did not simply leave their lord's manor might be because they have not worked through, with sufficient reach, all the ways in which that sentence commits and entitles them to alternatives and incompatibilities; rather, they have

understood what each word means in a much smaller net of inferential bonds. Children have to negotiate the conceptual challenges they face as 11-year-olds for whom concepts of financial independence or economic self-sufficiency have limited referents in the present, never mind traction in their grasp of medieval affairs. The substantive concepts of worth, ownership, and social hierarchy underpins the teacher's 'as-teller' objective. If the salient student inferential bonds were made explicit in a timely fashion, that is, in response to referent resonance not in lieu of it, a much greater 'of-doer' focus might have helped students to reach the understanding hoped for, even though it had such a strong 'as-teller' feel. If it is indeed the case that we do not acquire a concept and *then* reason with it, but rather, that a concept's meaning is a reasoning process in and of itself, and then we reason with it some more, conceptual change is an altering of reasoning which begins under one shape and turns into reasoning under another, for any and all concepts; it is not the absence and then presence of reasoning depending upon the type of object-knowledge in question. Perhaps Sarah thought she could offer students relevant substantive content and the incumbent syntactical understandings would materialise (if she imagined they were not already present). As a teacher educator, I have often seen student-teachers take the opposite approach: attempting to explain syntactical knowledge to students in the hope they will apply it to fresh substantive content. Students who are bewildered by 'tied to land' or 'harvest-dependent' are no more ready to understand that 'the Black Death was a big deal' than students who are told that 'agency and circumstance intertwine'; not because they do not understand the words, but because of the shallow reach of the inferential bonds that constitute their words' meanings. Rather than consider the student weak in one type of knowledge (substantive or syntactical), and therefore in need of more of the other to develop their thinking,, the inferentialist thinks neither type is useful if understood using a correspondence theory of meaning and that any type of object-knowledge may serve equally well to move learning on if inferentially informed in the knowing-subject.

We cannot check for the deployment of words without checking for the deployment of adequate meaning and meaning is not given in the representation but is made in '*the space of reasons*' that constitutes the representation. It is the depth of the concept user's relevant reasoning and referent resonance that counts, rather than simply which type of concept is needed or how effective the teacher is at combining concept types. Students' meaningful deployment of concepts breaks down when their sensitivity to the inferential relations which constitute the concepts they use cannot bear the weight of the referent-recognition the teacher wishes it could convey. From an inferential perspective, educationalists begin by inducting students into the things to be named, not simply into the words that name them. Rather than put all instructional design into attending to what students can do with concepts once they have been defined, teachers could consider how having a concept in the first place is itself an act of reasoning.

Conclusion

Teachers miss out on helpful ways to identify students' existing inferential networks, determine how to break into existing networks, and leverage conceptual change because instructional design intervenes in meaning-making well downstream of where it begins.

Knowing that there are different types of concepts has directed attention to how these types interrelate in order to teach both effectively. However, from an inferentialist perspective, to simply frame our discussions of conceptual development around existing theoretical underpinnings is to leave ourselves open to misplaced dualism and to continue the inherent ambiguities and silences. The idea that students will be able to answer historical questions once they have learned particular facts, definitions and procedures is equally ill formulated as the notion that they will learn the relevant facts, definitions and processes by trying to answer historical questions. Inferentialism gives us a new language with which to scrutinise instructional design. It can challenge entrenched factions that would portray different educational ideas as rivals, and it can provide a credible alternative to those who think that existing limitations can be addressed simply by achieving an (undertheorized) middle ground that holds differing approaches in constructive tension.

The adoption of an inferentialist approach has much to offer teacher educators and their students. A genuine understanding of words as symbols and of the way in which words come to symbolise through a particular reasoning experience, needs to be translated into teachers' abilities to determine (both existing understandings and the understandings demanded by, or capable of being generated by, the content-activity pairings) and to harness students' prior knowledge in service of conceptual development.

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