CUMULATIVE COHERENT CURRICULUM DESIGN: PUTTING CONCEPTS TO WORK

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WHAT ARE WE GOING TO BE CONSIDERING?

• How knowledge is structured and why an appreciation of this matters
• Focus in on conceptual knowledge – how can we put concepts to work?
• Conceptual knowledge and curriculum design
• Conceptual knowledge and teacher knowledge
• The legitimacy and/or authenticity of our knowledge claims
• Sharing a social realist perspective
CAMBRIDGE PRIMARY REVIEW

“the muddled language of ‘subjects’, ‘skills’, and ‘knowledge’ which confounds curriculum debate”

(Alexander, 2010: 7)
LEGITIMACY OR AUTHENTICITY OF OUR KNOWLEDGE CLAIMS
https://youtu.be/o7rHoWKpS1A
Michael Young explains that knowledge is powerful ‘if it predicts, if it explains, if it enables you to envisage alternatives’. Building on this, he provides three distinctions or criteria for ‘powerful knowledge’:

1. **It is distinct from the ‘common sense’ knowledge we acquire through everyday life**
   
   We will grasp knowledge about where we live and other aspects of life through our daily experience. This is important, but it is limited to the context in which we live. Schools should seek to surpass this, giving us knowledge that we wouldn’t otherwise have access to.

2. **It is systematic.** The concepts of powerful knowledge are ‘systematically related to each other’ in groups that we call subjects or disciplines’. Powerful knowledge therefore allows us to generalise and think beyond particular contexts.

3. **It is cumulative**. Powerful knowledge has been developed ‘by clearly distinguishable groups, usually occupations, with a clearly defined focus or field of enquiry’. These groups include a range of experts, from scientists and mathematicians, to novelists and musicians.
DIFFERENT TYPES OF KNOWLEDGE

• Experiential knowledge – information gained by living
• Factual knowledge (sometimes known as propositional) - constitute knowledge of WHAT
• Conceptual knowledge - Conceptual knowledge consists of the interrelations among the basic elements within a larger structure than enable them to function together (Anderson et al., 2001, p. 29). It includes knowledge of categories, principles, and models.
• Declarative knowledge - involves knowing THAT something is the case - that J is the tenth letter of the alphabet, that Paris is the capital of France.
• Procedural knowledge - knowledge exercised in the performance of some task (often known as a skill)
• Generative knowledge - A fundamental principle of cognition then is that learning requires knowledge (towards understanding)
• Substantive knowledge - The knowledge accrued in the discipline
• Subject Knowledge - Subjects relate to disciplines. School history and the discipline of history.
• Disciplinary knowledge – refers to knowledge associated with one academic discipline.
• Metacognitive knowledge - "cognition about cognition", "thinking about thinking", "knowing about knowing", becoming "aware of one's awareness" and higher-order thinking skills
‘Collective representations are therefore the means societies use to transcend the limits of individual experience to see beyond appearances to the real nature of relations in the (natural and social) world. All societies need to connect the material and the immaterial, the known and the unknown, the thinkable and the unthinkable, the here and the not here, the specific and the general, the past, present and future’

Lisa Wheelahan, (2010:95)
• “Coming to know is an activity, and it depends on experience, so knowledge is ‘activity and experience’, not its antithesis; and factual, or propositional knowledge is but one kind of knowledge among many.” (Alexander, 2010: 21)

A subject is not in itself old fashioned just because subjects have been used as an organising devise for over a century. If as enacted in the classroom, a subject is irrelevant, it is the teacher who makes it so’ (Alexander 2010: 246)
KARL MATON AND LEGITIMATION

When actors make knowledge claims or engage in practices they are at the same time making a claim of legitimacy for those practices, knowledge claims and practices can thus be understood as languages of legitimation, claims made by actors carving out and maintaining intellectual spaces within education.’ (2010: 37)
Legitimation Code Theory (LCT) is an explanatory, sociological, analytical tool that enables educational researchers to reveal (visually) the generative principles by which knowledge claims are legitimised and authorised. (Luckett, 2012: 22)

LCT construes knowledge as both socially produced and real, in the sense of having effects...LCT is a practical theory...it comprises a multi-dimensional toolkit, with each dimension offering concepts for analysing a set of organising principles. There are 5 dimensions: Semantics, Specialisation, Autonomy, Temporality and Density. (Maton)
THE DIMENSION OF SEMANTICS
SCHOOLS ARE SPECIAL PLACES

Certain aspects of our way of life, certain kinds of knowledge, certain attitudes and values are regarded as so important that their transmission to the next generation is not left to chance in our society, but is entrusted to specially trained professionals (teachers and TAs) in elaborate and expensive institutions (schools)’.  

Lawton, 1975, p.7
Research consistently shows that the quality of instruction, which in turn depends on the knowledge, skills and dispositions of teachers is a powerful determinate of pupil learning. Indeed, as Eric Hanushek from Stanford University puts it: ‘No other attribute of schools comes close.’ Moving a child from an average to a top teacher’s class means that they will learn in six months what would otherwise have taken them twelve. Moreover, good teachers seem to have disproportionately strong impact on pupils from disadvantaged homes. Good teachers therefore also help to close the gap in attainment.

Allen and Sims, (2018: 3)
I wish to suggest that the point of education is that students learn something, that they learn it for a reason and that they learn it from someone.

Robin Alexander (2008:77)

• Teaching, in any setting, is the act of using method x to enable students to learn y.
• Teaching has structure and form; it is situated in, and governed by, space, time and patterns of student organisation; and is undertaken for a purpose.
Could do better: Using international comparisons to refine the National Curriculum in England
The crucial nature of ‘organising concepts’ has been highlighted in psychological research since the 1960s (Ausubel DP 1960). The more recent work on organising concepts (or ‘schemata’) has been used to develop highly effective medical training (Newble D & Clarke RM 1986). The research in this area is compelling. ‘Organising concepts’ are needed to facilitate retention in memory, develop economic mental processing, and support analytic reasoning. Concepts and principles are critical. The specific information embedded in contexts can decay into mere ‘noise’ unless individuals have concepts and principles to organise and interpret the content of those contexts. The critical role of concepts is reinforced by work on ‘surface’ and ‘deep learning’ (Black P & Wiliam D1998).
Knowledge is, of course, fundamental – as is retention of information in memory (Wyer RS (ed) 1995). Pupils should emerge from schooling with large bodies of knowledge (Young M 1971; Young M 2010) – but the critical issue is this: organising concepts and principles are crucial to the acquisition and retention of this knowledge (Bernstein B 1971) – bodies of specific knowledge can be tied to the progressive development of these fundamental concepts and principles.
Curricular materials in high-performing nations focus on fewer topics, but also communicate the expectation that those topics will be taught in a deeper, more profound way...' (Schmidt W & Prawat R 2006 p1). Their analysis of mathematics emphasises that ‘curriculum coherence’ should also be demonstrated through arranging concepts in an appropriate age-related hierarchy.
THE STRUCTURING OF KNOWLEDGE MATTERS

Two Dimensional Curriculum Model
- Factual Content
- Processes & Skills

Three Dimensional Curriculum Model
- Factual Content
- Processes & Skills
- Concepts & Principles

Generalisation
- Concept
- Topic
- Facts

Concept
- Topic
- Facts
A universal concept is a mental construct that is timeless, universal and abstract (to different degrees).

Concepts are a higher level of abstraction than facts in the structure of knowledge. They serve as cells for categorising factual examples.

Conceptual understanding continues to grow more sophisticated as new examples fill each concept. Because concepts are timeless they are universal, their examples can be derived from any culture.

A conceptually organised curriculum helps solve the problem of the overloaded curriculum. Concepts bring focus and depth to study and lead students to the transferable, conceptual understandings. These ideas are commonly referred to as enduring understandings or essential understandings (Erickson, 2008: 30)
Conceptual Understanding
Extending from the familiar and concrete to the unfamiliar and abstract. Making greater sense of key concepts by organising & connecting information & ideas.

Contextual knowledge
Demonstrating greater fluency within an aspect of a subject, drawing on increasing breadth and depth of content and contexts.

Content
Working with more complex information about the world, including people’s attitudes, values and beliefs.
• **Which key concepts will you focus on?** Concepts are the key organising ideas or principles from a curriculum subject.

• **What motivating context** are you going to use to exemplify the concepts?

• **What content are you going to prioritise** in relation to the concepts and context?
Art and Design
**Key Concepts include**: line, shape, form, colour, tone, texture.

Computing
**Key Concepts include**: logic, abstraction, machines, algorithms, program, data

Design and Technology
**Key Concepts include**: design, nutrition, technology, data, evaluate.

English
**Key Concepts include**: speaking, listening, reading, writing, comprehension, transcription, vocabulary, punctuation, grammar
Geography
Key Concepts include: place, space, scale, environment, interconnections, physical and human processes.

History
Key Concepts include: chronology, significance, culture, change and continuity, cause and consequence, interpretation, sequence, duration.

Languages
Key Concepts include: communication, production, fluency, spontaneity, pronunciation, intonation

Maths
Key Concepts include: Number, pattern, shape and space, fluency, measure, geometry, statistics, algebra
Music
• **Key Concepts include**: melody, harmony, pitch, tempo, timbre, rhythm, composing, performance, notation.

Physical Education
• **Key Concepts include**: movement, agility, balance, co-ordination, competition, co-operation, sequence, health, fitness, fairness, respect

Science
• **Key Concepts include**: working scientifically, plants, animals including humans, materials, seasons, habitats, rocks, light, sound, electricity, forces, evolution and inheritance, earth and space.
TEACHERS NEED:

• Knowledge of the curriculum (Subject Knowledge - What)
  • Intent – appreciating the significance of different types of knowledge

• Knowledge of their context (How to engage pupils)
  • Implement – know about child development and learning

• Knowledge of how to sequence the curriculum (Why you are prioritising what, when)
  • Implement - Pedagogy – in relation to the subject

• Knowledge of what progress looks like (Why you are prioritising how, when)
  • Impact – so that we can justify why we do, what we do when and then, and only then, after justification can we meaningfully assess impact.
WHY DOES THIS MATTER

• Schools are special places, teachers have a particular professional knowledge base, and there are social justice issues at stake.

Dylan Wiliam, TES, 31st May 2019

• In many ways, teaching is an unusual job. It shares with other professions the requirement that individuals make decisions with imperfect knowledge, but, unlike other professions, there is no shared knowledge base – no set of facts that all involved in doing the job would agree on.

• In my view, teaching appears to be less "professional" than other professions because the problems that teachers need to solve are just much harder. Physics works because protons and electrons don’t have good days and bad days; they behave consistently, and predictably. As soon as humans are part of the picture, things get a lot more complicated.
HOW CAN WE MAKE THIS KNOWLEDGE VISIBLE?

‘I am not offering here an argument against the conception of teaching as a skill, I am instead arguing for its insufficiency – its incompleteness as an account of teaching ability and performance.’ Lee Shulman (1986: 12)

Issues around ‘tacit knowledge’ and the craft model of teaching

Issues around expertise and ‘in the moment’ decision making

Issues around ‘embodied’ teacher knowledge

Is there a cumulative professional knowledge?
LEGITIMATION CODE THEORY (LCT)  HTTP://WWW.LEGITIMATIONCODETHEORY.COM/
**Teachers’ Standard 1: Set high expectations which inspire, motivate and challenge pupils**

- establish a safe and stimulating environment for pupils, rooted in mutual respect;
- set goals that stretch and challenge pupils of all backgrounds, abilities and dispositions;
- demonstrate consistently the positive attitudes, values and behaviour which are expected of pupils.

Teachers make the education of their pupils their first concern, and are accountable for achieving the highest possible standards in work and conduct. Teachers act with honesty and integrity; have strong subject knowledge, keep their knowledge and skills as up-to-date and are self-critical; forge positive professional relationships and work with parents in the best interests of their pupils.

<table>
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<tr>
<th>Key Terms</th>
<th>Meaning</th>
<th>Implications for your practice</th>
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<tr>
<td><strong>Stimulating environment</strong></td>
<td>Creating a learning environment in which pupils feel safe, secure, valued and enabled to progress.</td>
<td>This may include classroom displays, your use of voice, and how you question and engage with the children. You will use and model appropriate subject-specific vocabulary, intentionally and consistently. Your environment will demonstrate an ability to take account of pupil’s individual needs.</td>
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<td><strong>Mutual Respect</strong></td>
<td>Creating a culture of respect and trust in the classroom that promotes effective relationships based upon mutual respect.</td>
<td>Teachers are key role models who can influence the attitudes, values and behaviours of their pupils. You will be ambitious to model the types of courteous behaviour expected by pupils. When appropriate you will apply rules, sanctions and rewards in line with school policy, escalating behaviour incidents as appropriate.</td>
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<td><strong>Knowing your pupils</strong></td>
<td>The ability to affect and improve the well-being, motivation, resilience and behaviour of your pupils by seeking opportunities to appreciate each pupil’s individual circumstances and capabilities.</td>
<td>High quality and inclusive teaching which has a long-term positive effect on pupils’ life chances, particularly for children from disadvantaged backgrounds. Your classroom organisation and management will demonstrate a deep understanding of individual pupils and their needs.</td>
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<td><strong>Positive attitudes</strong></td>
<td>Creating a positive environment where the need for effort, perseverance, the valuing of both knowledge and kindness are part of the daily routine.</td>
<td>You will aim to recognise and praise pupils’ efforts and progress appropriately so that you are able to motivate and inspire your pupils increasing their personal confidence.</td>
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<td><strong>Stretch and Challenge</strong></td>
<td>Creating accessible, relevant, enjoyable yet appropriately ambitious learning opportunities, within a well-crafted and progressive curriculum.</td>
<td>You will endeavour to make careful curriculum judgements about which aspects of which subjects to prioritise when so that pupils can make progress and gain a deep satisfaction from their learning and progress.</td>
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<td><strong>Values</strong></td>
<td>Values are basic and fundamental beliefs</td>
<td>Setting clear expectations can help to communicate shared</td>
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**Links with Teachers’ Standards**

4, 5, 7, and Part Two

**KNE Dispositions**

We enable you to reflect on what you believe that primary education is for, and to develop your own philosophy for education that has been carefully thought through. Robin Alexander states "Education is about the here and now as well as the future, but schools should also address the wider condition and needs of children and society in today’s complex world. Children leaving primary school should of course be ready for what follows, but what follows year 6 is life, not just year 7?"

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**Co-analytical Questions**

- How have you contributed to ensuring the classroom is a stimulating environment? How could you?
- How have you ensured tasks are relevant and engaging?
- How have you used your knowledge of pupils to plan to challenge and support?
- How do you seek to be a positive role model in class and in the wider school?
- How do you seek to enact the school’s policies on inclusion and behaviour?
- How do you seek to ensure pupils feel comfortable in lessons and able to contribute?
- How do you foster effective collaboration in their classroom?
- What have you learned from the school’s health and safety policy? How is this evident in your planning? How do you ensure pupils are aware?
A RETURN TO PEDAGOGY

Alexander (2008: 47). The prominence of curriculum in English educational discourse has meant that we have tended to make pedagogy subsidiary to curriculum. My own preferred definition has it the other way round: *pedagogy is the act of teaching together with its attendant discourse of educational theories, values, evidence and justifications. It is what one needs to know, and the skills one needs to command, in order to make and justify the many different kinds of decision of which teaching is constituted. Curriculum is just one of its domains, albeit a central one.*
PEDAGOGY

• What are the concepts of teaching?
  • Curriculum
  • Assessment
  • Pedagogy
  • Knowledge
  • Learning
  • Teaching
  • Inclusion

Extending from the familiar and concrete to the unfamiliar and abstract. Making greater sense of key concepts by organising & connecting information & ideas.
• To know whose voice is speaking is the beginning of one’s own voice (Bernstein, 2000: xxv)

• Education can have a crucial role in creating tomorrow’s optimism in the context of today’s pessimism. But if it is to do these, then we must have an analysis of the social biases in education. These biases lie deep within the very structure of educational system’s processes of transmission and acquisition and their social assumptions. (Bernstein, 2000: xix)