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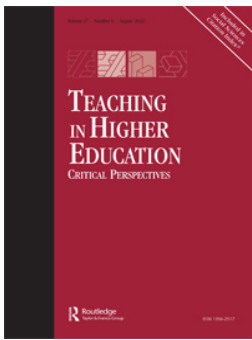
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RESEARCH ARTICLE

'The shadows of "boundary" remain': curriculum coherence and the spectre of practice

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ABSTRACT

This paper will re-visit the origins and early use in South African curriculum writing of the concept of 'coherence'; it will go on to show how Suellen Shay and her colleagues fleshed out the concept and created an instrument for its empirical analysis; it will then step back and examine the contribution and some problems that were brought to light; examine briefly how Shay's later work continued to wrestle with the notion of 'practice', particularly in light of curricula that were judged to display conceptual coherence; and will suggest one possible solution in the seminal paper by Bernstein (2000). Finally, the paper will reflect on two implicit definitions of 'curriculum', a 'strict' one and an 'extended' one and suggest why they should be distinguished.

Introduction

This paper will examine the notion of 'curriculum coherence' and the difficulties it raises for the idea of practice in a social realist account of knowledge. It will do this looking first at the under-appreciated paper that Suellen Shay, together with colleagues, wrote for SANTED (South Africa Norway Tertiary Education Development Programme) (Shay et al. 2011; see also Paxton et al. 2010). Shay's paper took a conceptual phrase of Muller's (2008), also written for the SANTED project, namely, 'conceptual and contextual coherence', extended it, and provided it with an empirical basis which shone an empirical light not only on the conceptual fruitfulness of the account but also illuminated some of the difficulties of this project, particularly with regard to accounting for the interpenetration of concepts in contextual coherence and practices in conceptual coherence.

Shay initially kept quite close to the neo-Bernsteinian approach of Muller and Gamble (2009), going on later to account for these problems in terms of Karl Maton's legitimation code theory (LCT). This is also a theory positioned in the broad church of social realism, a theory that seeks to go beyond Basil Bernstein's foundational theory of knowledge structures. The contention of this paper is that, although Shay produced a series of analyses using LCT and shed elegant light on issues both conceptual and empirical (see inter alia, Shay 2013, 2014; Kilpert and Shay 2013; Shay and Steyn 2015; Shay 2016), this move took her somewhat away from Bernstein's original analysis of 'discourses' which is where, this paper will argue, one solution to the problem of 'practice' can be found. It also

moved the focus away from the 2011 paper which, this paper will argue, made a breakthrough contribution, especially in its crafting of a methodology to anatomise higher education curricula, which was only modestly taken forward by the community of scholars compared to her later formulations in Shay (2013). This was only partly due to where the respective papers were published.

This paper will proceed by re-visiting the origins and early use in South African curriculum writing of the concept of 'coherence'; it will go on to show how Shay and her colleagues fleshed out the concept and created an instrument for its empirical analysis; it will then step back and examine the contribution and some problems that were brought to light; examine briefly how Shay's later work continued to wrestle with the notion of 'practice', particularly in light of curricula that were judged to display conceptual coherence; and finally will suggest one possible solution in the seminal paper by Bernstein (1990).

Why coherence? A brief genealogy of the notion of 'coherence' in South African texts on curriculum

Ayelet Becher has said recently that 'There is a broad consensus among scholars that coherence is crucial for program design in higher education' (Becher 2022, 577). She goes on to concede a little further on that in professional development programmes, the term remains 'conceptually ambiguous' (579). That is likely an understatement. The same term is used for quite different purposes. Sundberg (2022) writing recently uses the term to denote policy alignment, pointing to the policy-practice gap. The starting point then is to accept that 'coherence' is recruited for different purposes at different times, with each address to a different problematic highlighting or foregrounding different facets of the broad metaphorical concept. This may well be a consequence of a concept in a horizontal knowledge structure like education that doesn't subsume hierarchically, so successively turns its face this way and that as the problem being addressed requires. However, as this paper makes plain, coherence is used here in a specific manner to refer to the *governing logic* in curricula which includes but goes beyond alignment.

The following section shows briefly that the curriculum term 'coherence' was first mooted to conceptualise school curricula. It was only with Shay's work that the term was re-fashioned to apply also to higher education curricula. The coherence story in curriculum analysis starts properly with the work of William Schmidt (see ia. Schmidt, Houang, and Cogan 2002, 2005, 2012), especially the work he directed examining the school curricular features of high-performing countries on TIMSS. What Schmidt and his team found was that those countries that did best sequenced their topics in the Mathematics and Science curricula to correspond to the hierarchical structure of the discipline. This presented the learners with a 'coherent' curriculum – that is, one aligned to the structural features of the discipline, in a logically connected sequence, which entailed less need for the repetition of topics and thereby maximised the 'opportunity to learn' of students. Lack of coherence (that is, lack of logical alignment), disrupted the hierarchical flow of learning and slowed it down or impeded it.

'Coherence' in South Africa, though, did not start with Schmidt. It started with another pressing problem, namely the havoc caused in South African school classrooms by the introduction of the progressive Curriculum 2005 (hereafter C2005), implemented

between 1998 and 2002, which had substituted themes for subjects as curriculum organisers and stipulated the curriculum in outcomes terms rather than in terms of content standards. Small scale studies began appearing soon after implementation which suggested that schools weren't coping with the new curriculum very well. These were amplified by the collection of Taylor and Vinjevold (1999) which displayed the disastrous impact on learning. Alarmed, then-Minister Asmal commissioned a National Review to pinpoint the problem.

The Review (Chisholm et al. 2000) found many faults in the curriculum design, summing these up through the illustrative use of the twin terms 'conceptual coherence' and 'connective[1] coherence'. A central flaw of the design, they found, was to present curricula that derived from hierarchical disciplines – principally Mathematics and Science, but also Biology and Geography amongst others – in an incoherent way. The way that the Review expressed it, C2005 presented these subjects which had hierarchically nested conceptual structures – in Review terms, those which required a design logic of *conceptual* coherence – in *contextually* coherent terms instead, thereby disguising the sequential logic of the material to be learnt. Incoherence, here then, denoted mixing conceptual and contextual (practical) elements together in an unprincipled, un-sequenced way. The concept as used here then entailed that one dominant logic should determine how the various kinds of elements could be combined, either via a conceptual logic or a contextual logic. Coherence thus referred not only to alignment but to an organisational logic.

Where did the review get these terms if not from the conventional usage by Schmidt and others? The provenance was not immediately obvious, but in retrospect, it is clear that the central idea, if not the terms themselves, had its roots in Bernstein's analysis of knowledge structures (Bernstein 1999, 2000). At that point in time, there was a thriving group of neo-Bernsteinian scholars in South Africa who had latched onto the 'knowledge structures' framework and had begun to deploy it to produce productive work in South African analyses of education, mainly schooling at first.

Bernstein's schema is well known, though, as this paper will go on to argue, the twists and turns of the argument may not have been fully grasped by all commentators, including the present writer at the time of the Review. The Bernsteinian story offered an analysis of two kinds of discourse, horizontal and vertical, and two kinds of vertical discourse, hierarchical and horizontal. The modifiers 'hierarchical' and 'horizontal' refer to the way that vertical discourses or knowledges are internally differentiated and elaborated. The latter two formed the disciplines, the reservoir from which curricula are selected. Bernstein's name was no-where mentioned in the Review.

Bernstein had introduced, explicitly for the first time in education, the founding tenet of sociology of knowledge that knowledges were essentially differentiated in terms of their internal but also their external features – the external ones referring to what Bernstein called the social base, meaning the sets of social relations that gave the corresponding knowledge communities institutional form – the professional organisation, the values, cultures and ethos of the communities that practiced those specialised forms of knowledge. Bernstein's point was not only that the internal relations of the knowledges should be studied alongside the external relations, but that the degree of differentiation in the one would vary with the other. In the event, these were rarely studied together, and the curriculum analysts, in South Africa as well as elsewhere, mainly studied the internal

relations, the forms of organisation either tending to the hierarchical or to the horizontal (see Stavrou 2022 for an interesting recent neo-Bernsteinian exception; see also Hordern 2016). 'Coherence' was not a term that Bernstein used, and if it has seeped into the contemporary Bernsteinian lexicon, this was mainly the result of the South African analyses.

Muller extended the usage and reach of the terms 'conceptual coherence' and 'contextual coherence' in a series of papers in the first decade of the millennium, including Muller (2006, 2007) culminating in the paper which was to directly impinge on Shay's analytical framework, Muller (2008; see also 2009).

There are two other usages of 'curriculum coherence' in the literature that deserve mention. The first is a signal attempt to blend the Schmidt analyses with Bernstein in a series of papers (Reeves 2005; Reeves and Muller 2005; Reeves and McAuliffe 2012), the latter paper notable also for a clear review of the then-extant 'coherence' literature as well as a sophisticated analytical framework that showed that even though the revised curriculum presented the topics in the mathematics curriculum more clearly, teachers were unable to implement it coherently, pointing to another link in the implementation chain necessary for coherent learning.

More recently, Elizabeth Rata and her team in Auckland have developed what they call a 'Curriculum Design Coherence' (CDC) model as a professional development tool for university lecturers as well as school teachers 'to design their programmes, courses, and topics, according to the epistemic structure of academic knowledge' (Rata 2021a, 465; see also Rata 2019, 2021b, and McPhail 2020). The difficulty for New Zealand school teachers, as for their South African counterparts with C2005, is that they are faced with a radical outcomes-based national curriculum, under-stipulated, leaving teachers to have 'complete autonomy' (ibid, 482) in selecting their topics to teach. Drawing on philosophers like Ryle and Winch as well as Bernstein, Rata and her colleagues have progressively refined the 'stuff' of curriculum into subject concepts, subject content, and subject-based competencies (called here 'knowledge how-to').

The CDC is very promising as a tool for what I would call instructional design, but the specific contextual needs of New Zealand teachers demanded a different kind of intervention to the one possible in South Africa where the interventions, following the Review, were at the level of the nationally stipulated curriculum, now called the Curriculum and Policy Statement or CAPS (see Hoadley 2018 for an account). The usage of the umbrella term 'curriculum' has thus been different: in South Africa's case, it can be called a strict (or restricted) notion of curriculum confined to the nationally stipulated intended curriculum; in New Zealand's case, the meaning moves to a more expanded sense of the term closer to the pedagogic interface. Whereas the former, as a nationally legislated text, lends itself to both national and international comparison, the CDC design process yields a text that is less comparable, although the CDC model clearly is generalisable, and has indeed been used fruitfully in South African university course design (see for example Naidoo and Mabaso 2020).

The relevance of the distinction between a strict and an extended definition of curriculum will become clearer later in this paper where the recontextualising affordances of each will be shown to be different. This cuts to the heart of the issue of 'practical' knowledge in the curriculum. Despite this, the CDC model, it should be clear, is principally pursuing alignment – of the epistemic structure of the curriculum to the discipline,

and of concepts to content, and both to competencies – and is thus closer in spirit to Schmidt's usage than to the South African usage.

From the Review of C2005 in 2000, then, towards the end of the decade, 'coherence' had been used mainly to shed light on the intended or nationally prescribed school curriculum. Schmidt and Rata's work had used 'coherence' to refer to curriculum – discipline concordance. The post-C2005 work shed light on the incoherence produced by contextual-conceptual blending. With Suellen Shay's work for SANTED, a related problematic arose, for which 'coherence' was recruited.

The SANTED project and its problems

In 2005, by governmental decree, six 'comprehensive' tertiary institutions were created by merging together traditional universities and other forms of higher education institution. Of particular interest was the merger between universities and universities of technology, called 'technikons' in South Africa. Problems of academic planning became obvious from the outset, the most serious being those of compatibility (different curricular content in similarly named qualifications); differences in entry competence levels of diploma and degree students; and the problems this poses for articulation between qualification types and level (the same content leading to qualifications of different types and levels). Two merged institutions, University of Johannesburg (UJ) and the Nelson Mandela Metropolitan University (NMMU) in 2006 joined forces and, propelled by Norwegian funding, a project was born, called SANTED (South Africa Norway Tertiary Education Development Programme) to provide a framework for thinking through these problems systematically.[2] At stake from the outset then was the aim to produce coherence between the qualifications of squabbling departmental groups now meant to offer common or at least compatible qualifications.

This section traces the journey of the trope of coherence from Muller through Gamble to Shay's research on SANTED:

Step 1: Muller's (1998) paper recontextualised the coherence trope from the Review of C2005 to a new requirement: to provide a framework ('conceptual guide') for thinking about tertiary qualifications in newly merged 'comprehensive' institutions. The guiding assumption was that disciplines matter when planning the curriculum; and that understanding why and how can assist in planning re-curriculation efforts:

(1) The paper traced the roots of disciplinary difference from the medieval distinction between the Trivium and Quadrivium to yield two 'fault lines': between the sciences (hard) and the Humanities (soft); and between pure and applied disciplines. This yielded a 4-part typology: hard pure; soft pure; hard applied; soft applied. Tony Becher (1989) had fleshed out the typology in terms of the cultural and cognitive styles of the four communities ('tribes') of disciplinary adherents.
(2) The paper next discussed how these feature of disciplines are consequential for curriculum coherence – mainly, that the more hierarchical the disciplines, the more sequence, pace and progression matter; and the limits to curriculum segmentation;
(3) The paper then fleshed out the consequent qualification paths in tertiary institutions and the knowledges and qualifications appropriate to these paths. The paper ended with a reflection of what the qualification mix might mean for institutional missions:

they should be clear as to whether they want to incline in a conceptually or contextually relevant direction, and their qualification mix should reflect this mission.

Step 2: Gamble (2009) set out to take the argument a step further: 'What we have to work out is how conceptual coherence and contextual coherence are possible when there is a requirement for practice (meaning vocationally and professionally oriented qualifications) to be included in the curriculum' (15). Gamble begins with two *knowledge forms* – conceptual and procedural (her word for the knowledge type appropriate to practice) – and divides each further into two. She then applies this to the coherence trope ending up with four forms of coherence: everyday contextual coherence (the world of ordinary practice); theorised contextual coherence (principled practice, where the principles can be either explicit or tacit, as in craft knowledge in Gamble (2004)); contextualised conceptual coherence (applied theory, which in Muller's version can take either a hard or a soft form); and theoretical conceptual coherence (likewise). With this, Gamble considers that 'what we have here are the gradations of Muller's original idea of conceptual and contextual coherence … manifest in restricted and elaborated forms' (Gamble 2009, 33). Note here that although Gamble derives the terms 'restricted' and 'elaborated' from Bernstein, they imply few of the features of Bernstein's original usage in his theory of speech codes.
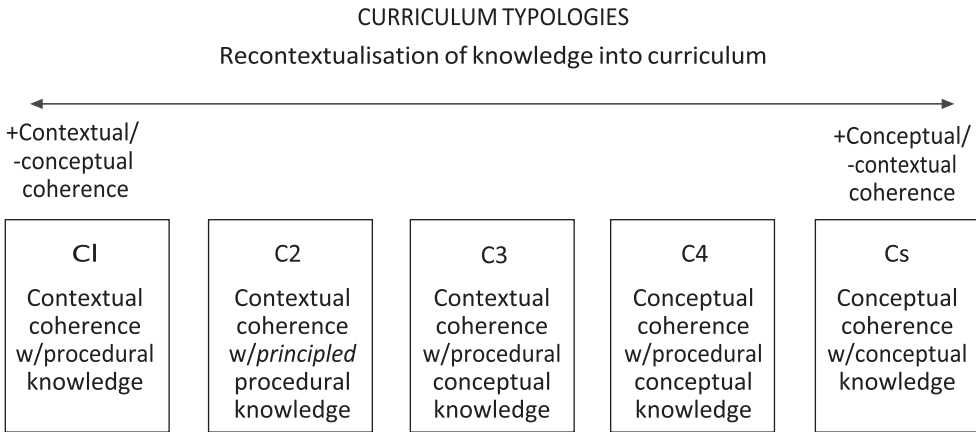
Step 3: Suellen Shay and the team were asked to take the curriculum analysis of comprehensives a step further and show, concretely, what this looked like for actually existing qualification paths. In order to operationalise the conceptual map provided by Muller and Gamble, they 'designed down' the schema in two stages:

(1) They produced a typology of *knowledge types* from Gamble Figure 1:
(2) Next, to operationalise these knowledge types, they discerned five *curriculum types* which they placed on a continuum from high conceptual/low contextual coherence to low conceptual/high contextual coherence, which became the methodological units for coding the knowledge content of the intended curricula of the qualifications in their sample Figure 2:
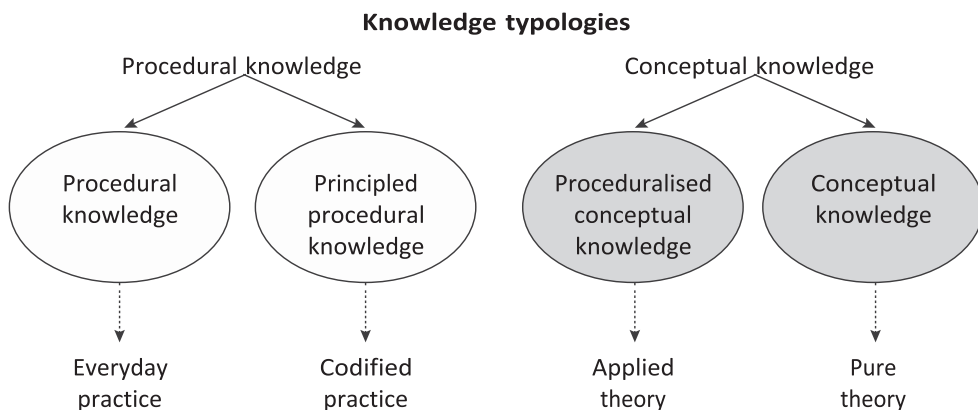
Figure 1. Knowledge typologies: adapted from Gamble 2009 (Shay et al. 2011, 98; used with permission)

CURRICULUM TYPOLOGIES

Recontextualisation of knowledge into curriculum

CI	C2	C3	C4	Cs
Contextual coherence w/procedural knowledge	Contextual coherence w/*principled* procedural knowledge	Contextual coherence w/procedural conceptual knowledge	Conceptual coherence w/procedural conceptual knowledge	Conceptual coherence w/conceptual knowledge

+Contextual/ -conceptual coherence   +Conceptual/ -contextual coherence

Figure 2. Curriculum typologies (Shay et al. 2011, 99; used with permission)

The sample of the empirical study comprised both a Diploma and an undergraduate degree from each of 4 fields of study: Built Environment (hard applied, in Becher's terms); Journalism & Media Studies (soft applied/pure); Architecture (hard applied); and Chemistry (hard pure). All but one of the qualifications were judged to be contextually relevant; only the BSc in Chemistry was adjudged conceptually relevant. Also, only in Chemistry could the Diploma be clearly differentiated from the degree. When the proportions of each curriculum type was coded for each qualification, some anomalies appeared: the degree in Building had less procedural-conceptual (C3) content than the Diploma, leading to questions about its level; the National Diploma of Journalism had the least theoretical content of all the qualifications, leading the authors to conclude that 'the most vulnerable diplomas in terms of conceptual development are likely to be the soft applied social sciences' (Shay et al. 2011, 110); and the coding categories, sensitive enough to pick up differences in other fields, were unable to detect the difference in 'Design' between the Diploma and the degree in Architecture, even though the academics concerned insisted they were there. (Here we see the difficulties an empirical operationalisation of 'knowledge types' has with coding what the paper below calls 'specialised procedural judgment').

All of the codings were also overlaid with ratings of cognitive complexity, producing a thicket of facts and data that can be quite hard to read and grasp at times. The primary virtues of the project were easily lost in this welter of data.

The central contribution was summed up by Shay at the end of Shay et al. 2011, 111; 'The central argument of the chapter is that differentiation debates – whether focused on curriculum, programme, qualification or institution – must pay attention to knowledge'. (In the more poetic language of Shay 2013, 580, when the implications of knowledge differentiation are extended to a theorisation of curriculum differentiation, 'the shadows of "boundary" (that is, disciplinary boundary) remain', hence the title to this paper).

Stripping away some of the confusing detail, this project clearly shows what knowledge works best at what level in what qualification, and that, armed with this knowledge,

university and faculty curriculum planners could re-design curricula far more coherently than they could without the clearer picture provided. Above all, the study 'underscores from an empirical basis (in support of the theoretically founded arguments of the social realists) that curricula in the higher education band should have a certain proportion of modules with conceptual knowledge' (Shay et al. 2011, 109). A comparison of the Chemistry and Journalism Diplomas makes the point graphically. This underscores the limits as well to the arguments for 'relevant' curricula which were growing more insistent again (see Shay 2016).

And yet, to my knowledge, the project fizzled out and did not go much further. Shay did however re-visit the project again in a number of subsequent publications both in standalone publications (Shay 2013, 2016) but also with her students (Kilpert and Shay 2013; Shay and Steyn 2015), amending her theoretical orientation in the process. This will be discussed further below.

What happened to practice?

In Shay (2013), probably her most comprehensive re-visiting of SANTED, certainly her best cited paper, she worries further about two things. The first is that 'practice' seems to get short shrift in the analysis, particularly as it applies to professional and vocational qualifications at technikons; the second is she partly ditches the coherence framework for one she adapts from LCT. The two are connected, conceding in Shay 2016, 771, that semantics is LCT's 'name for "coherence"'. She now thinks that Muller (2009) presented too 'simplified' a picture of the relation between the conceptual and the contextual because it is depicted as a one dimensional 'continuum'. (It is arguable whether he presents them in a continuum at all. He says that it is 'not a simple continuum' (Muller 2008, 24); after all, the Engineering curriculum would place its knowledge mix in the middle of the continuum, which would give it moderate conceptuality as well as moderate contextuality which would be evidently wrong.) The continuum notion is arguably first mooted in Figure 2 above in Paxton et al. 2010, 19 and repeated in Shay et al. 2011, 98.

However that may be, Shay here adopted the LCT framework with its dimensions of semantic gravity and density. Semantic gravity (SG) refers to how embedded a meaning is in its context; semantic gravity (SG) refers to the degree of complexity (condensation of meaning) in knowledge practices. Together these generate a two-dimensional typology with boundaries between the quadrants instead of a continuum, with gradations along each vector Figure 3:

Shay might have achieved a similar end, by using Gamble's (2009) two-dimensional typology yielding four discrete cells, which is also based on a boundary between empirical and conceptual domains, a boundary Gamble always insisted on. Curiously, Shay nowhere refers to this Figure 4:

Gamble had here spotted a similar issue to Shay, who may have found the scaling in terms of semantic density and gravity more elegant to work with. Her version of the four-way typology allows her to account for two features she felt unable to do with the earlier framework: to account for curricula that are 'not *either* contextually or conceptually coherent but can be both or neither' (Shay 2016, 772,3). This solves the Engineering curriculum conundrum posed by a 'simple continuum' referred to above. It also allows her
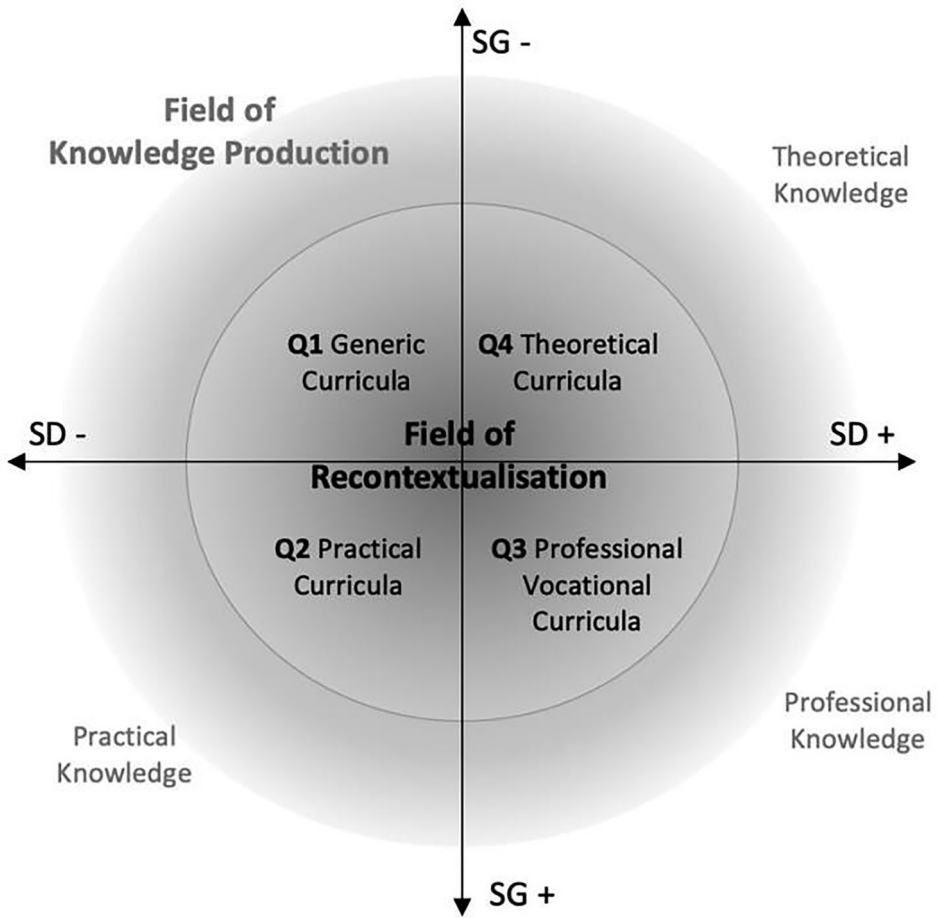
Figure 3. Semantic field of recontextualised knowledge (adapted from Shay 2013, 572 by Nicky Wolmarans; used with permission)

to scale each dimension, gravity or density, as strong or weak, allowing for a two-dimensional depiction of a field of curriculum.

conceptual coherence

Tacit conceptual coherence.   Contextualised conceptual coherence
Restricted   **elaborated**

Everyday contextual coherence   Theorised contextual coherence

contextual coherence

Figure 4. Gradations of curriculum coherence in a knowledge-practice curriculum (Gamble 2009, 33: used with permission.)

There is however a curious slippage here. A conversation that started off by discussing more or less conceptually or contextually informed forms of recontextualised curricular knowledge 'bits' – 'context' as 'in here' in the curriculum, has now morphed into a discussion of the contextual as something 'out there': the context as the workplace and its demands and requirements. It is consequently not always easy to judge which she means to refer to. To put it another way, when she uses 'contextual', it is not always clear whether she is referring to a form of knowledge or a site of application. The same goes for 'practice'; when the reference is to practice as practical knowledge and when to workplace practice is not always easy to discern. This is possibly the reason that Gamble prefers to talk about principled and procedural forms of knowledge, and possibly also why the C2005 Review avoided the term 'contextual' altogether, going with a hardly improved substitute 'connective' instead.

The question then remains: are there different kinds of practical or procedural knowledge, and if so, how are they to be conceptualised? Shay's scaling distinguishes between high and low semantic gravity, but this really scales proximity to or distance from the external context. What is 'practice' when we consider it in differentiated form in the curriculum?

Forms of curriculum knowledge re-considered

The above discussion has made plain that there are at least two conflations to avoid when considering what 'practice' is, or better perhaps 'practical knowledge', and how it is best represented in the curriculum. The first conflation is that of 'practical knowledge' in the intended curriculum – that is, recontextualised procedural knowledge – and practice or practical competence 'out there' in the work-place. For example, project work in an Engineering course requires responding to a recontextualised problem, and the response can be graded; competence to do a real-world engineering project is perhaps partly shaped by what is learnt in the coursework, but also by experience and much else besides. It is not helpful for the sake of clarity to run these two together. The second might be the consequence of the former, but practical competence, or specialised procedural judgment, is always much more than curricular procedural knowledge.

The second conflation is the more difficult one to avoid, because it is the heritage of a powerful philosophical tradition, rationalism, which has tended to equate all knowledge with propositional or theoretical knowledge and practical knowledge therefore with a kind of sensory-based principle-less residue – practice as everything that is not theory, hence the enduring palimpsest in our common-sense of the polarity between theory and practice. When we realise the problem as the empiricists did, it is all too easy to end up valorising 'practice' as an unalloyed good and promoting its inclusion in the curriculum, but without saying how this should best be done. This is, inter alia, what the C2005 designers did. As we saw above, both Gamble and Shay realised the problem. Shay's solution was to scale it on a plane from high to low semantic density (see Figure 3 above). Gamble's was to argue that procedural knowledge could be principled or segmental, and that conceptual coherence curricula could contain both conceptual and procedural forms of knowledge. Both of these are distinctly an advance, but both have a tendency to run together practice and practical knowledge, although Gamble's schema takes us arguably further.

I find it helpful here to return to Bernstein's original formulation. Bernstein (2000) turns briefly to the distinction separating horizontal discourse from vertical discourse, the reservoir of the disciplines and hence subjects. Bernstein argues that 'a vertical discourse takes the form of a coherent, explicit and systematically principled structure' (Bernstein 2000, 157). Yet this is a structure of what? What comprises the discourse? Recall that what distinguishes a subject from a discipline is that subjects are recontextualisations from vertical discourse. A subject, following Gamble (2009), is composed of two epistemic domains, the propositional domain and the domain of procedural knowledge of which there are many subtypes – judgments, techniques, transversal skills, and so on, (see Winch 2010). Each of the domains stands in need of curricular description.

One key point is that each of these domains can be more or less hierarchical. To conceive of procedural knowledge as hierarchical might seem odd (Gamble had said 'more or less elaborated'), but that is probably only because we are used to equating procedural knowledge with horizontal contextual or practical knowledge in the corporeal sense. Yet Bernstein was explicit that procedural knowledge could be hierarchical in the sense of part of vertical discourse: 'The procedures of *vertical discourse* are then linked, not by contexts, horizontally (as in horizontal discourse), but the procedures are linked to other procedures hierarchically' (Bernstein 2000, 160). That is, when procedural knowledge is incorporated into an intended curriculum, by recontextualisation – which lifts it out of its original context – it necessarily becomes systematised in a way it was not in its original context. It now becomes part of curricular discourse. If it does not undergo this systematisation, there is no means for integrating it into the curriculum, which is systematised – or 'specialised', as Hordern (2021) has it – by definition.

There is thus not only conceptual content in procedural knowledge, as both Shay and Gamble were at pains to point out, but there is also procedural knowledge in subjects traditionally conceived as highly specialised. Muller (2014) gives the example of History, with its mass of facts as well as its set of highly specialised procedures sometimes called 'disciplinary' or 'second order' knowledge (see for example Chapman 2021, 13), but one could argue that the specialised procedural knowledge is in fact more hierarchical, certainly also more 'conceptual', than the pool of horizontally massed facts, the 'substantive' knowledge or knowledge content, which the expert historian arranges into intelligible narratives on the basis of her expert procedural or 'disciplinary' knowledge. The discipline of Philosophy is regarded by Winch (2010, 114) in similar vein, remarking that 'it would be misleading to call it a body of organised knowledge, as opposed to (a) systematic forms(s) of inquiry', which are nothing if not hierarchical – that is, linked by meanings in a nested fashion. To paraphrase Muller (2014, 140), if procedural knowledge without conceptual content is mechanical, conceptual knowledge without animating procedures is inert. Perhaps that is what Suellen Shay meant when she referred to 'the integration of verticality and "contextuality"' (Shay 2014, 580).

The strict and the extended senses of curriculum re-considered

There is no doubt that Shay's re-description of the SANTED analytical framework in terms of LCT has lent her analytical framework some extra nuance and subtlety. Thus, she argues persuasively, 'the difference between practical or everyday knowledge and *principled* practical knowledge of the craftsman is a difference in degrees of density.

The difference between theoretical knowledge and applied or proceduralized theoretical knowledge is the difference in degrees of gravity'. (Shay 2013, 570). This is a helpful distinction. But it raises another question. We know where the systematised, specialised theoretical knowledge is systematised and codified – it is through the activities of disciplinary communities, journals and publication. We also know that this is a crucial quality filter because it allows for collective quality control over time. When such knowledge is codified into the disciplinary mainstream, we are entitled to say that this is the best knowledge we have so far, a resource for curriculum recontextualisation. In short, it can be regarded as general and reliable because it has been socialised.

When Shay says that 'practical workplace knowledge is codified into principles' (ibid, 574), where does this codification occur? And what kind of quality filter does it have? Is there a repository or archive for it so that it can be shared, compared, handed down? Where exactly is it turned into systematised, recontextualised vertical discourse, albeit of a proceduralised form? In mature professions there are such institutions for the collective weighing and dissemination of principled practical knowledge in dedicated casework journals, as there is in surgery, law, engineering and architecture for example (see Muller 2016). In what Foray (2011) call 'structurally weak' fields, these do not function as proper filters for the profession at large, or do not exist at all. As Muller 2016, 86 says, 'If the social base is under-socialized and the distributive rules undeveloped, the traffic back will be restricted, innovation will be privatized and change in the profession will be restricted', irrespective of how innovative the individual classroom teacher may be. In other words, selecting 'practical' knowledge into the instructional design for teaching may solve the teacher's dilemma, but it does not necessarily solve the dilemma of a generalisable, disseminatable curriculum beyond the classroom. This is the strict or intended curriculum, which is public, governed in professional fields by national or international institutions, and intended to be compared and judged by external criteria of probity.

In the case of the extended curriculum, teachers are tasked with selecting from the discipline and from their own principled practical knowledge, as is the case of Gamble's (2004) expert craftsman. This knowledge is often uncodified, or if codified, of restricted circulation. This is the case with Rata's teachers who are in the business of assembling coherent lessons from all the resources at their disposal. I think that it may well have been this constituency that Shay had in mind in much of her later work. But that curriculum text is a different one to a public curriculum text of the kind she worked with in SANTED.

Conclusion

Some of the positives of Shay's dissemination of 'coherence' into South African higher education curriculum discourse include the following:

(1) It has, for the first time, allowed a synoptic view of the span of qualifications and their intended curricula in the newly formed 'comprehensive' universities. It showed itself able to map a systematic view from an institution's mission to the best coherent shape of its qualification and curriculum composition. This particular utility has not nearly been exploited by the country's institutions to date.

(2) By drilling down into the corresponding curriculum particulars, Shay and her team were also able to illuminate the internal coherence of curricula, including those that not only unimodally followed a conceptual or a contextual logic, but crucially for comprehensives, those that mixed elements from both whilst still regulated by the dominant logic of one or the other. Those that lost their regulating logic were also clearly displayed.

(3) What was not as clearly displayed in the SANTED project was that all curricula must necessarily have elements of both conceptual and procedural knowledge, even those that seem to be most conceptually hierarchical. What the coherence lens also did less to illuminate was that its operationalisation cannot easily describe elements of high-level design and specialised procedural judgment, at least not in a way that is amenable to intended curriculum stipulation, hence the difficulty experienced by Suellen and her team in differentiating the Architecture Design course for both Diploma and degree purposes. The very heart of disciplinary logic is, in a certain sense at least, only revealed to its adepts, and these are not always best placed to engage in curriculum design.

Perhaps then, coherence is a concept that best lends itself to some particular purposes and not to others. I suspect that Suellen Shay divined this, and this partly motivated her move towards what she saw as the more elegant logic of LCT and which she put to nuanced use in her later work.

Notes

1. This became 'contextual coherence' soon after, the two terms denoting the same thing.
2. For a history of the SANTED project and the policy environment in which it was conducted see Oosthuizen 2014.

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Disclosure statement

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References

Becher, Anthony (Tony). 1989. *Academic Tribes and Territories.* Buckingham: Open University Press.

Becher, Ayelet. 2022. "When Context Meets Knowledge in University Professional Education: Organizational Factors Influencing Coherence in Teaching and Social Work." *Higher Education* 83: 577–595.

Bernstein, B. 1999. "'Pedagogy, Identity and the Construction of a Theory of Symbolic Control': Basil Bernstein Questioned by Joseph Solomon." *British Journal of Sociology of Education* 20 (2): 265–279.

Bernstein, B. 2000. *Pedagogy, Symbolic Control and Identity: Theory, Research. Critique*. Oxford: Rowman & Littlefield.

Chapman, A. 2021. "Introduction: Historical Knowing and the "Knowledge Turn"." In *Knowing History in Schools: Powerful Knowledge and the Powers of Knowledge*, edited by A. Chapman, 1–31. London: UCL Press.

Chisholm, L., J. Volmink, T. Ndhlovu, E. Potenza, H. Mahomed, J. Muller, C. Lubisi, et al. 2000. *A South African Curriculum for the Twenty First Century*. Pretoria: Department of Education.

Foray, D. 2011. "Knowledge Economy and Services' Industries – a Case Study of the Educational Sector." In *Brain Drain or Brain Gain? Changes of Work in Knowledge-Based Societies*, edited by B.-J. Krings, 33–56. Berlin: Edition Sigma.

Gamble, J. 2004. "Tacit Knowledge in Craft Pedagogy: A Sociological Analysis." Unpublished PhD thesis. Cape Town: University of Cape Town.

Gamble, J. 2009. "The Relation between Knowledge and Practice in Curriculum and Assessment." Concept paper commissioned by Umalusi. Pretoria: Council for Quality Assurance in General and Further Education and Training. E. publication. http://www.umalusi.org.za/docs/research/2009/jgamble.pdf.

Hoadley, U. 2018. *Pedagogy in Poverty: Lessons of Twenty Years of Curriculum Reform in South Africa*. Oxford: Routledge.

Hordern, J. 2016. "Regions and Their Relations: Sustaining Authoritative Professional Knowledge." *Journal of Education and Work* 29 (4): 427–449.

Hordern, J. 2021. "Specialized, Systematic and Powerful Knowledge." *London Review of Education* 19 (1): 1–11.

Kilpert, L., and S. Shay. 2013. "Kindling Fires: Examining the Potential for Cumulative Learning in a Journalism Curriculum." *Teaching in Higher Education* 18 (1): 40–52.

McPhail, G. 2020. "The Search for Deep Learning: A Curriculum Coherence Model." *Journal of Curriculum Studies* 53 (4): 420–434.

Muller, J. 2006. "Differentiation and Progression in the Curriculum." In *Knowledge, Curriculum and Qualifications for South African Further Education*, edited by M. Young, and J. Gamble, 66––686. Pretoria: HSRC Press.

Muller, J. 2007. "On Splitting Hairs: Hierarchy, Knowledge and the School Curriculum." In *Language, Knowledge and Pedagogy*, edited by F. Christie, and J. R. Martin, 65––686. London: Continuum.

Muller, J. 2008. *In Search of Coherence: A Conceptual Guide to Curriculum Planning for Comprehensive Universities. SANTED Project*. Johannesburg: CEPD.

Muller, J. 2009. "Forms of Knowledge and Curriculum Coherence." *Journal of Education and Work* 22 (3): 205–226.

Muller, J. 2014. "Every Picture Tells a Story: Epistemological Access and Knowledge." *Education as Change* 18: 255–269.

Muller, J. 2016. "The Body of Knowledge." In *Pedagogic Rights and Democratic Education: Explorations of Curriculum, Pedagogy and Assessment*, edited by P. Vitale, and B. Exley, 76–86. Oxford: Routledge.

Naidoo, D., and M. Mabaso. 2020. Deep Conceptual Learning Opportunities in Business Studies Classrooms." *Journal of Education* 81: 136––1158. doi:10.17159/2520-9868/i81a08.

Oosthuizen, M. 2014. "Challenges Relating to the Establishment of Comprehensive Universities in the South African Higher Education Sector." In *Driving Change: The Story of the South African Norway Tertiary Education Development Programme*, edited by T. Gibbon, 103–126. Somerset West: African Minds.

Paxton, P., M. Oosthuizen, R. van der Merwe, and S. Shay. 2010. NMMU Case Study and TTT2 Report, October 2009. Port Elizabeth: NMMU.

Rata, E. 2019. "Knowledge-rich Teaching: A Model of Curriculum Design Coherence." *British Educational Research Journal* 45 (4): 681––6697.

Rata, E. 2021a. "The Curriculum Design Coherence Model in the Knowledge-Rich School Project." *Review of Education* 9 (2): 448–495.

Rata, E. 2021b. "Curriculum Coherence and the CDC Model: A History Example." In *Perspectives on the Knowledge Problem in New Zealand Education: Towards Equity*, edited by M. Lourie, and G. McPhail, 23–32. Singapore: Springer.

Reeves, C. 2005. "The Effect of 'Opportunity-to-learn' and Classroom Pedagogy on Mathematics Achievement in Schools Serving Low Socio-economic Status Communities in the Cape Peninsula." Unpublished PhD dissertation. Cape Town: University of Cape Town.

Reeves, C., and S. McAuliffe. 2012. "Is Curriculum Incoherence Slowing Down the Pace of School Mathematics in SA? A Methodology for Accessing Coherence in the Implemented Curriculum and Some Implications for Teacher Education." *Journal of Education* 53: 9––36.

Reeves, C., and J. Muller. 2005. "Picking up the Pace: Variation in the Structure and Organization of Learning School Mathematics." *Journal of Education* 23: 103––1130.

Schmidt, W., and R. Houang. 2012. "Curricular Coherence and the Common Core State Standards for Mathematics." *Educational Researcher* 41 (8): 294–308.

Schmidt, W., R. Houang, and R. Cogan. 2002. "A Coherent Curriculum: The Case of Mathematics." *American Educator* 26 (10): 1–18.

Schmidt, W., H. Wang, and C. McKnight. 2005. "Curriculum Coherence: An Examination of US Mathematics and Science Content Standards from an International Perspective." *Journal of Curriculum Studies* 37 (5): 525–559.

Shay, S. 2013. "Conceptualizing Curriculum Differentiation in Higher Education: A Sociology of Knowledge Point of View." *British Journal of Sociology of Education* 34 (4): 563–582.

Shay, S. 2014. "Curriculum in Higher Education: Beyond False Choices." In *Thinking About Higher Education*, edited by R. Barnett, and P. Gibbs, 139–156. London: Springer.

Shay, S. 2016. "Curricula at the Boundaries." *Higher Education* 71: 767–779.

Shay, S., M. Oosthuizen, P. Paxton, and R. Van Der Merwe. 2011. "Towards a Principled Basis for Curriculum Differentiation: Lessons from a Comprehensive University." In *Curriculum Inquiry in South African Higher Education*, edited by E. Bitzer, and M. Botha, 93–112. Stellenbosch: SunMEDIA.

Shay, S., and D. Steyn. 2015. "Enabling Knowledge Progression in Vocational Curricula: Design as a Case Study." In *Knowledge-building: Educational Studies in Legitimation Code Theory*, edited by K. Maton, S. Hood, and S. Shay, 138–157. London: Routledge.

Stavrou, S. 2022. "Structuring Forms of Transition from Higher Education to Employment: Bridging Bernstein and Bourdieu in Understanding Mismatch." *Journal of Education and Work* 35 (2): 124–138. doi:10.1080/13639080.2022.2036709.

Sundberg, D. 2022. "Curriculum Coherence: Explaining the Intended and Enacted Curriculum in Different Schools." In *Equity, Teaching Practice and the Curriculum: Explaining Differences in Access to Knowledge*, edited by N. Wahlström, 76–89. London: Routledge.

Taylor, N., and P. Vinjevold. 1999. *Getting Learning Right: Report of the President's Education Initiative*. Johannesburg: Joint Education Trust.

Winch, C. 2010. *Dimensions of Expertise: A Conceptual Exploration of Vocational Knowledge*. London: Continuum.