Weaving a local curriculum from a visionary framework document

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Abstract
Many national curriculum documents include competencies that add dispositional demands to traditional knowledge and skills, and link these to ‘21st century’ challenges. New Zealand’s national curriculum includes a set of key competencies adapted from the OECD originals. However, weaving a coherent curriculum from the more traditional subject-based content and newer components such as key competencies has proved to be more demanding than was anticipated. This paper introduces a curriculum-weaving model based on the premise that key competencies should change learning in non-trivial ways. The model draws on the ‘capabilities approach’ from developmental economics and emphasises the teacher’s role in shaping rich learning experiences with both immediate and future-focused learning in mind. The model identifies a small number of capabilities that add important intellectual and practical changes to the subject-based elements of the curriculum. Where these capabilities need to be deployed, it is almost certain that most of or all of the key competencies will be in play. Thus the model provides a practical guide to support teachers’ local curriculum-making as well as their in-the-moment teaching and learning decisions.

Keywords: Capabilities approach; Key competencies; Local curriculum design

An introduction to the weaving dilemma
Many national curriculum documents now include some version of competencies, which typically signal the importance of outcomes such as critical and creative thinking, ability to interact with diverse others, and self-management abilities (Voogt & Pareja Roblin, 2012, summarise common elements in such frameworks). Such competencies have an emphasis on dispositional demands, in addition to knowledge and skills, and are explicitly linked to employment and living challenges in the 21st century. The New Zealand Curriculum (NZC) (Ministry of Education, 2007) includes such features. Specifically, there is a set of key competencies adapted from the OECD originals (OECD, 2005). These are named as: Managing self; Relating to others; Using language, symbols and texts; Thinking; and Participating and contributing. There is also a vision statement that says all students should become “confident, connected, actively involved lifelong learners” (Ministry of Education, 2007, p.8).

NZC is a framework document. There is an explicit expectation that all schools will use this framework to build a local curriculum appropriate for their students. However, in the decade since NZC’s introduction there has been little official guidance on how to weave a coherent curriculum that will meet the learning needs of specific groups of students. It is up to schools and teachers to
bring together the more traditional subject-based content which constitutes the back half of the document and the more future-focused generic components such as the key competencies and vision statement that sit in the front half of the document. A set of succinct ‘essence statements’ potentially provides a bridge between these two very different halves of NZC. Each pithy high-level statement articulates the contribution made by a learning area to a student’s overall education. (There are eight learning areas in total: science; mathematics; English; social sciences; technology; health and physical education; languages; the arts.) To illustrate, the essence statement for science reads as follows:

In science, students explore how both the natural physical world and science itself work so that they can participate as critical, informed, and responsible citizens in a society in which science plays a significant role (Ministry of Education, 2007, p.17).

The structure of this statement conveys a clear and unequivocal message that all students learn science so that they can become capable citizens. However the traditional goal of science learning, especially in the secondary school, has been to encourage suitably talented students to keep on learning science and to build a foundation of knowledge and skills that will allow them to keep studying the subject at university. Of course these two broad sets of goals are not incompatible (scientists are citizens too), but neither are they the same. The emphasis is different, as are some of the important outcomes envisaged. The weaving model introduced in this paper assumes that key competencies should play a key role in reframing and refocusing the enacted curriculum, so that future-focused aims such as that articulated for science can be more purposefully addressed. First, however, teachers do need to realise that the key competencies are intended to change the curriculum, not just to add something extra on top of what is already taught (Reid, 2006; Hipkins, 2012).

Almost a decade after NZC was published, the challenges of devolving curriculum-making to individual schools and teachers are clearer than they were when NZC was being developed. Without specific guidance, key competencies risk being treated as superficial curriculum add-ons, or being set aside for ‘business as usual’ after an initial flurry of interest (Hipkins, 2012). However across this decade there has also been a great deal of recursive learning about the nature and potential impact of key competencies on the enacted curriculum (Hipkins & Boyd, 2011). Innovative teachers and schools have been able to forge new learning pathways notwithstanding the lack of widespread change among their peers. Hipkins, Bolstad, McDowall & Boyd (2014) draw on a range of examples that illustrate such innovation. Building on insights generated by these and other curriculum innovators, this paper introduces a curriculum-weaving model designed to address the known implementation challenges. The model is based on the premise that key competencies should change the curriculum that students experience, and do so in non-trivial ways that reflect the high-level vision collectively conveyed by the newer elements in the front part of NZC. The second section of the paper introduces the model and provides the rationale for its various components.

The third section of the paper then explains how and why the model draws on Sen and Nussbaum’s ‘capabilities approach’ from developmental economics.
In brief, the overarching goal of the capabilities approach is to support each learner to become the person they are capable of being (for an introduction to the approach see Nussbaum, 2011). The fourth section explains how the model addresses a widely-debated dilemma that sits at the heart of the capabilities approach, namely whether or not to specify those things that we want all students to be capable of - what Sen and Nussbaum call “functionings” (see Griffiths, 2016, for a cogent discussion of this dilemma for education). While it is possible to envisage a great many important capabilities, the model emphasises a small number that we have found to be implicated in a diverse range of rich tasks and to add important intellectual and practical changes to the different curriculum learning areas, and the subjects within them. We have called these three sets of capabilities: critical inquiry; perspective-taking; and disciplinary meaning-making. Where these capabilities need to be deployed, it is almost certain that most of or all of the NZC key competencies will be in play.

An important premise for this work is that teachers need a practical guide to support local curriculum-making as well as their in-the-moment teaching and learning decisions. We think that the model has promise for this purpose but of course it also has limitations. These are briefly discussed in the final section of the paper, along with possible next steps.

### An introduction to the weaving model

There are reciprocal relationships between the learning areas and the key competencies. When these relationships are purposefully exploited both the learning areas and the key competencies are strengthened. Opportunities to develop KCs can play out as opportunities to develop learning areas and vice versa (Key Competencies and Effective Pedagogy website).

This ‘touchstone’ was developed for a project funded by New Zealand’s Ministry of Education. They wanted to know how meaningfully key competencies were being embedded into the learning areas of NZC and what effective practice might look like. The reasoning behind the touchstone is more fully elaborated in the weaving model, which followed several years later. Figure 1 is the current version of the model. It has been collaboratively developed over a number of iterations. No changes have been made in recent months but the design process should remain open-ended, given that discursive elaboration of the enacted curriculum always has the potential to throw up new insights (Hipkins & Boyd, 2011).

NZC defines key competencies as “capabilities for living and lifelong learning” (p.12). This definition resonates with the high-level vision for students to be and become “confident, connected, actively involved lifelong learners” (p.8) and is supported by other newer features such as a set of values to be “encouraged, modelled and explored” (p.10). However for this vision to become more than fine sounding aspirations the key competencies and values do need to be meaningfully woven together with subject-based learning. The model shows how this might be done, while also addressing two interrelated and common misunderstandings. One is that key competencies replace the learning of substantive knowledge and hence water down the enacted curriculum. The other is that a student-centred curriculum implies that key learning decisions must be devolved to students. The interwoven strands of “what the teacher does” (in blue)
and “what the student brings” (in red) visually convey the message that this is not the case at all.

Figure - 1. The current version of the model

The following numbered points set out the logic of the weaving structure for the red and blue sections of the model:
1. Key competencies direct attention to students’ ability to do something with the concepts they learn (from across all the learning areas). This means that teachers need to think about meaningful and suitably challenging purposes for learning – i.e. what it is important the students are able to do as a result of their learning.

2. The essence statement for each learning area in NZC provides a guide for thinking about purposes for learning. In turn, this thinking should influence the way key competencies are woven together with curriculum content.

3. Teachers need to design rich tasks to achieve the weaving they want to happen. These will be tasks that bring together concepts or big ideas from one or more learning areas and appropriate aspects of all the key competencies.

4. Once rich learning experiences have been designed the teacher must ensure that the pedagogy used is appropriate to the learning challenges envisaged and also create a safe environment in which students can risk really stretching their learning. NZC has a section on effective pedagogy so the model includes this aspect in the weaving.

5. Taking account of what students bring to the learning is an important challenge for teachers to keep in mind. Traditionally teachers have helped students expand their knowledge and skill base. They still need to do this but now they also need to help students build and strengthen aspects of their key competencies. Different students will bring different strengths and learning needs – both in terms of their existing knowledge and their existing competency levels. Rich learning experiences will create space for all students to stretch and develop beyond what they already know and can do.

6. Differing cultural backgrounds are a specific example of a student dimension that teachers must factor in to how they design and orchestrate rich learning. Being culturally competent themselves is now regarded as an important professional responsibility for teachers in many nations, including New Zealand, where there has been a substantive investment in developing knowledge of what that might look like in the classroom (Berryman, 2009).

The following points set out the logic of the purple part of the model. Here the twin threads of student attributes and teacher decision-making and action come together and the idea of ‘capabilities’ makes its appearance as the actual weaving takes place.

1. Rich tasks include a conceptual focus and a ‘doing’ focus that draws on aspects of all the key competencies. But it is hard to focus the intended learning if we just say every key competency is needed. This is where the idea of capabilities can help.

2. A ‘capability’ is demonstrated in action. It is what the student shows they can do – and is willing to do – as a result of their learning. Capabilities remix aspects of all the key competencies and weave them together with important knowledge and skills.

3. Learners need to become capable in many different areas of their lives and their learning. There are so many important capabilities that we could never name and explicitly develop them all. Some focus is needed. A small number of really important capabilities is more likely to be kept ‘in teachers’ heads’ as a guide for classroom actions and pedagogical choices.

4. When rich tasks are designed in ways that support the development of one or more capabilities, teachers and students understand why this learning is important right now, as well building important aspects of these capabilities for their futures (Hipkins & McDowall, 2013).

The logic just outlined suggests that capabilities interpret NZC in ways that are more specific about the combinations of knowledge, skills, attitudes and values that enable action in meaningful situations. They are essentially thinking and weaving tools that remix aspects of all the key competencies with specific learning objectives, with specific purposes for learning in mind. In this way,
capabilities are intended to support greater awareness that the presence of key competencies in the curriculum implies real changes in the intended learning, not just doing more of the same but better. The provenance of the capabilities approach provides further insights into how and why the specific capabilities named on the model were chosen over the many other possibilities signalled by the plus sign in the otherwise empty cell.

**Why capabilities?**

The ‘capabilities approach’ was originally devised by Amartya Sen and Martha Nussbaum to address social justice issues that arise from economic inequalities. Typical measures of economic prosperity such as Gross Domestic Product (GDP) and average income obscure very large differences between individuals and groups. Some people are able to achieve the ‘functionings’ of which they are capable. Others cannot, or do not choose to do so, for a range of reasons. The capabilities approach addresses inequalities by inquiring whether people are able to be and become the people they are capable of being, and how social structures act to enable or constrain their opportunities and choices to do what they want to do. As one example, Sen names public reasoning (i.e. ethical and political frameworks, and considerations of whose knowledge counts) as influences that enable or constrain individual’s ways of being and doing (Sen, 2004). Thus the wider capabilities conversation originated at the intersection of various fields of social inquiry (economics, education, health, inclusion, and public policy-making). Human thriving in the world is seen to implicate a complex mix of all these fields of influence (Nussbaum, 2011 provides contextualised examples).

A range of arguments have been advanced for adopting the capabilities approach to address challenges in the education sector. Some researchers in special education, or who research the impact on learning of poverty, poor health, or racial violence (and sometimes all of these in combination) appear to have been the first to introduce the capabilities into education inquiry frameworks (e.g. Walker, 2008). Some contrast a capabilities perspective with a resources perspective (e.g. Scherrer, 2014). The latter looks to things such as school funding, or teachers’ levels of expertise when addressing inequality of achievement and/or opportunity. The capabilities model is invoked to argue that an accounting of such resources is not enough as a measure of how well we are doing in meeting the challenge of educating all our students in ways that allow them to become the people they are capable of being. Yet others, as we have done, envisage an emphasis on capabilities as a means of ensuring that the rhetoric of a future-focused curriculum translates meaningfully into practice (e.g. Smits, 2014).
What capabilities?

There is an important difference between Sen and Nussbaum concerning the specification of normative sets of capabilities. Nussbaum has described a high-level set - currently 10 capabilities, one of which is education (Nussbaum, 2011). Broadly, her argument is that people need a starting place for action and ongoing critical thinking and analysis. However Sen prefers the idea of capabilities to remain underdetermined so that the role of contexts in allowing individuals to develop their capabilities is not neglected. Griffith (2016) proposes a solution to this dilemma. He invokes Dewey’s argument that learning should support students to remain open to new action possibilities and he draws parallels between this intention and the capabilities approach. To address the difference between Sen and Nussbaum he draws on Dewey’s argument for the importance of cultivating “general abilities” of the individual’s body and mind. He names these as: “practical intelligence, imaginative reflection, plasticity of habit, sensitive awareness of social and environmental interdependencies, and coordination of thought and action, among other things” (p.5). Griffith notes that Dewey valued such abilities (here translated to mean capabilities) for their expansive character in opening up individuals to the world and to greater possibilities for their lives. This is precisely the role claimed for adding key competencies to the present-day curriculum.

The set of capabilities included in our model serendipitously resembles Dewey’s general abilities as just outlined. Our set evolved in response to a prosaic assessment conundrum. We had been asked to retrospectively assess students’ key competency development as part of the National Monitoring Study of Student Achievement (NMSSA). This programme aims to provide information about student achievement at year 4 and again at year 8, and trends over time, across the breadth of the New Zealand Curriculum (NZC). Several learning areas are assessed each year and the programme was nearing the end of the first cycle when our key competencies study began. Because each key competency is so multifaceted there are endless possible ways in which they might be demonstrated. Therefore generalising progress from isolated instances could not be justified. The methodology we designed after much deliberation was predicated on the weaving argument set out earlier in this paper.

We began our actual analysis by searching for assessment tasks that would have required students to draw on aspects of at least two or three key competencies. A distinguishing feature of the NMSSA programme is that for many assessments students work one-on-one or in small groups with a teacher assessor so it was not hard to find a range of tasks that required them to demonstrate aspects of key competencies. We then looked for capabilities that students needed to demonstrate in one way or another across different learning contexts as they completed the required assessment tasks. The three sets of capabilities outlined below quickly became apparent in principle, but took some time to scope and define in practice.

Critical inquiry encompasses activities such as gathering and interpreting data; using evidence to support ideas; and critiquing evidence. These were the titles given to the first three of a small set of ‘science capabilities’ that provided a prototype for the whole-curriculum weaving model. The science capabilities were
developed to help weave the parts of the science curriculum together with the key competencies and the science essence statement (Hipkins & Bull, 2015). Subsuming the prototype set into the wider model provided for continuity and coherence but also allowed us to draw on our earlier design experiences to scope the likely parameters of this capability in the context of NZC.

Critical inquiry demands both critical and creative thinking. It helps build students’ awareness of how new knowledge claims are made and justified. Different discipline areas have their own specific inquiry practices so it is important that students experience critical inquiry in a range of learning areas. Inquiry capabilities are cross-cutting with perspective-taking and disciplinary meaning-making. Any rich inquiry will require students to draw on their capabilities in all of these aspects, and hence on all of their key competencies.

It is obvious that Thinking (as one of the five key competencies) is implicated in critical inquiry. The following brief outline illustrates how the key competency of Managing Self might also come into play. The research literature suggests that critiquing evidence is a particularly demanding aspect of critical inquiry to develop (e.g. Kuhn, 2015; Osborne, 2014). With practice and support, students learn need to keep an open mind as they set aside their own ideas to consider other possible explanations. Doing so requires self-discipline and self-awareness (both aspects of managing self). In learning areas like health/PE and social studies critique could involve students in identifying their own assumptions and values, and then comparing them with those of others. Sometimes the ‘evidence’ to be critiqued is the student’s own work. This is centrally important the production of original work in the Arts for example but is an important part of self-assessment in any subject. Again this sort of critique demands self-awareness and self-discipline.

**Perspective-taking** refers to the ability to ‘see’ an idea, action or challenge from the perspective of one or more other people. It links most directly to the NZC key competency of Relating to Others. However it also has strong links to critical thinking and critical literacy. In an earlier project called *Key Competencies and Effective Pedagogy* this emerged as an important component of many rich learning tasks.

Perspective-taking is an important social capability and brings an emotional dimension to learning. However it is also integral to a range of cognitive challenges such as: writing for a specific audience and/or purpose; exploring an author’s ideas and agenda in a literary text; appreciating differences in how people understand the world; employing design processes to achieve a product or technological solution that meets a specific user’s need; understanding why people might hold different points of view; and considering what has been included and what has been overlooked when an inquiry was designed (for example a social inquiry, or a statistical inquiry).

**Disciplinary meaning-making** requires students to take the ‘perspective’ of the discipline (to think like a scientist, mathematician or literary critic for example). This is a complex and multifaceted type of capability. It is most closely related to the key competency of Using Languages, Symbols and Texts. Students also need to think critically as they work with the various texts of a specific
This type of capability is essential for accessing the ideas of others, as well as expressing understanding and ideas, and creating ideas. There is much more to disciplinary meaning-making than the words used or the way they are assembled, i.e. the grammar of the written texts of a discipline. All of the following can have discipline-specific differences: conventions for organising data (as graphs, tables etc.); how 'models' of reality are created and used as thinking supports (actual models, diagrams, maps, plans, metaphors etc.); what symbols convey and how their meanings have been agreed as conventions; and how visual images are constructed – e.g. how colour, perspective and symbolism are used to convey meaning in literary texts.

Brief snapshots such as these can only begin to describe the open and expansive nature of each capability set. However the detail provided should be sufficient to demonstrate similarities to Dewey's 'general abilities' as deployed by Griffith (2106) to point the way forward in adapting the capabilities approach to education.

There remains one further feature of the model to introduce. The phrase “living and contributing as active engaged citizens in the world”, which appears at the base of the model, represents the overarching vision for expansive learning that provides students with opportunities to develop and stretch their capabilities. Different aspects of the three sets of capabilities outlined in this report, and many more, come together when students take their learning out into the world beyond school. Arguably this phrase is not sufficiently highlighted in the graphic, given the many possible voluntary life activities and choices that capabilities might empower. Examples drawn from the purposes for learning articulated in the NZC learning areas, in combination with the key competency of Participating and Contributing, include:

- Sustaining and extending capabilities built in school. Examples could include: reading an increasingly demanding range of texts for pleasure and leisure; practising and extending specific techniques such as those learned in the arts, technology, or PE; using growing communication skills in another language; and finding out more about questions and issues of personal interest.
- Taking personal action for wellbeing. Examples could include regularly undertaking some form of exercise; choosing foods that are healthier options; and enjoying a rich range of leisure activities including arts opportunities to express personal feeling and values.
- Demonstrating personal responsibility where there is a choice of ways to act: making more sustainable choices; exercising safe and ethical digital practices; and being respectful of appropriate practice in a different cultural context.

**Limitations, early promise, and next steps**

It could be argued that the idea of capabilities, as just outlined, simply substitutes one set of complexities for another. Clearly they are every bit as multifaceted as the key competencies themselves so what has been gained? Our response would be that, unlike the generic idea of key competencies, capabilities are anchored in actual demonstrations of learning. They provide signposts to
what teaching and learning might strive to achieve when the parts of NZC are woven as intended. Of course teachers will have many more goals than just these. However the intention to specifically develop one or more of these areas of capability enhances the possibility that the teacher’s design thinking will include other goals that deploy knowledge and skills to achieve some of the more visionary ideals of NZC when read as a fully woven framework.

The capabilities have already proved their worth in the NMSSA analysis that led to their genesis. In a sense this is a ‘proof of concept’. A high-level finding from the NMSSA programme is that Year 4 students are broadly making progress consistent with NZC but by Year 8 there are signs that many of them have yet to reach the anticipated learning outcomes for the relevant curriculum level. The science learning area is just one that has shown this pattern (Educational Assessment Research Unit & New Zealand Council for Educational Research, 2013). A detailed retrospective analysis of students’ demonstrations of the capability of disciplinary meaning-making suggests that, at least in part, the overarching pattern can be explained by Year 8 students’ continuing use of everyday meaning-making strategies. Many of them seem not to be aware of the simple age-appropriate science conventions specified at the relevant NZC curriculum level. Similar patterns have been found in retrospective analyses of English: Viewing and Mathematics and Statistics. These findings have practical value. The new types of reports are now being written for a teacher audience, with the intention of providing valuable epistemic insights grounded in concrete examples of specific teaching and learning possibilities.

The model introduced in this paper has no official status as curriculum policy. However it has been used in several other MOE-funded policy initiatives, where it has proved as helpful as in the NMSSA example just outlined. Since this paper was first written, ongoing work has led to “Taking action” being added to the set as a fourth, specifically named capability. This paper sets out the weaving logic behind the model but makes no normative claims for the actual capabilities specified. They are proving useful in our curriculum context and might also be so in other contexts. The bigger picture curriculum debate and discussion that they engender is arguably their most important characteristic.

Notes
1. Parts of this paper, including the weaving diagram, have been published on websites in New Zealand. However this paper is the first to elucidate the rationale for inclusion of each part of the diagram, and to explain why the capabilities approach was chosen as a theoretical framing for the work.

References


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