

How the key competencies were developed: The evidence base

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Introduction

This is one of two papers developed for an MOE funded project, *Competencies in NZC*. This paper draws on archived policy discussion papers to document the provenance of the key competencies included in the *New Zealand Curriculum (NZC)*.¹ The second paper analyses a series of research projects to describe how understandings about key competencies have developed over the decade since NZC was published.

In this paper, the evolution of the key competencies over the time span of the *NZC* development is illustrated via the visual models that supported thinking at different stages of the curriculum project. The types of evidence and processes used to support their development are also summarised.

The OECD DeSeCo project

The concept of key competencies originated in a project completed by the Organisation for Economic Development (OECD). OECD runs the PISA international tests that assess the readiness of students at age 15 for work and life beyond school. The initial PISA assessments tested how well students could adapt and use their reading, mathematics and science knowledge in contexts that are important for life and work. Problem-solving was added to this initial mix but the PISA developers were aware that they needed an additional conceptual framework to make other ways of adapting and using knowledge more visible. To this end the DeSeCo (Definition and Selection Competencies) project was initiated.²

DeSeCo was a multi-stage project that aimed to develop a framework to guide the development of PISA assessments. The specific question that guided the project was “what demands does today’s society place on its citizens?” Initial inputs included: a critical analysis of international studies related to possible indicators of different types of educational outcomes; a review of scholarly work on the concept of competence; expert opinions about competence from scholars in different academic disciplines; and comments from policy-makers and practitioners. These inputs were discussed at an international symposium in 1999, which was followed by a process for different OECD countries to contribute feedback. A second symposium took place in February 2002. The aim was to work

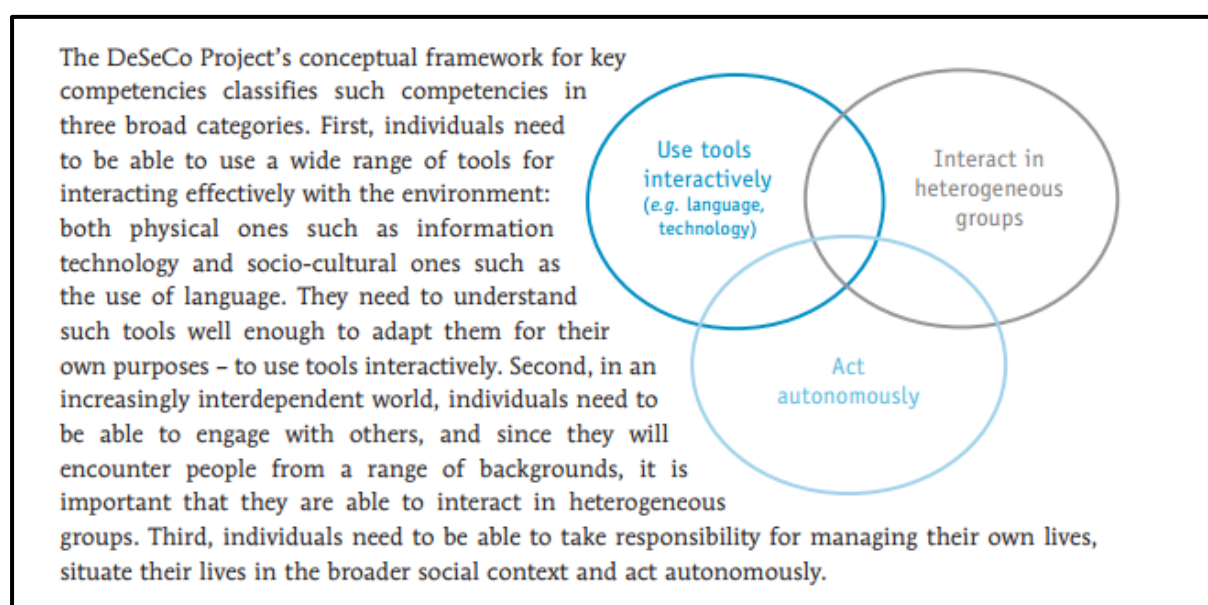
¹ Ministry of Education (2007). Wellington: Learning Media. Available at <http://nzcurriculum.tki.org.nz/The-New-Zealand-Curriculum>

² The close relationship between PISA and DeSeCo is evident in the placement of the Executive Summary of the DeSeCo project on the internet. It is hosted on the PISA website: www.oecd.org/pisa/35070367.pdf

towards a consensus about the critically important competencies from among the wide range suggested by participating countries, stakeholders, and interest groups.³

The DeSeCo process culminated with the description of four key competencies. These four were labelled 'key' because it was thought that: every student would need them, regardless of their life circumstances; they were relevant across cultures and continents; and they were interdisciplinary and hence relevant to all learning areas of the curriculum. Many other competencies had also been named during the process, but these four were considered to be the foundation on which all the others could be built. Three of the four are shown in Figure 1.

Figure 1: The original conceptual model produced by the DeSeCo project.⁴



The fourth competency group named by DeSeCo was “cross cutting competencies”, and specifically critical thinking. These competencies were seen as those that need to be deployed alongside one or more of the other three, in action.

Adapting to OECD key competencies for NZC

Early in the development of NZC the Ministry of Education (MOE) commissioned policy advice about how the DeSeCo developments might best be translated into the New Zealand context, and specifically how they might be included in NZC.

In addition to the DeSeCo work, the first of these papers⁵ was informed by a Curriculum Stocktake undertaken by a team from the University of Waikato. This stocktake had reported uneven

³ More detail, and references for outputs as the project unfolded, can be found in the summary report published after the project was completed:
www.netuni.nl/courses/hre/uploads/File/deseeco_finalreport_summary.pdf

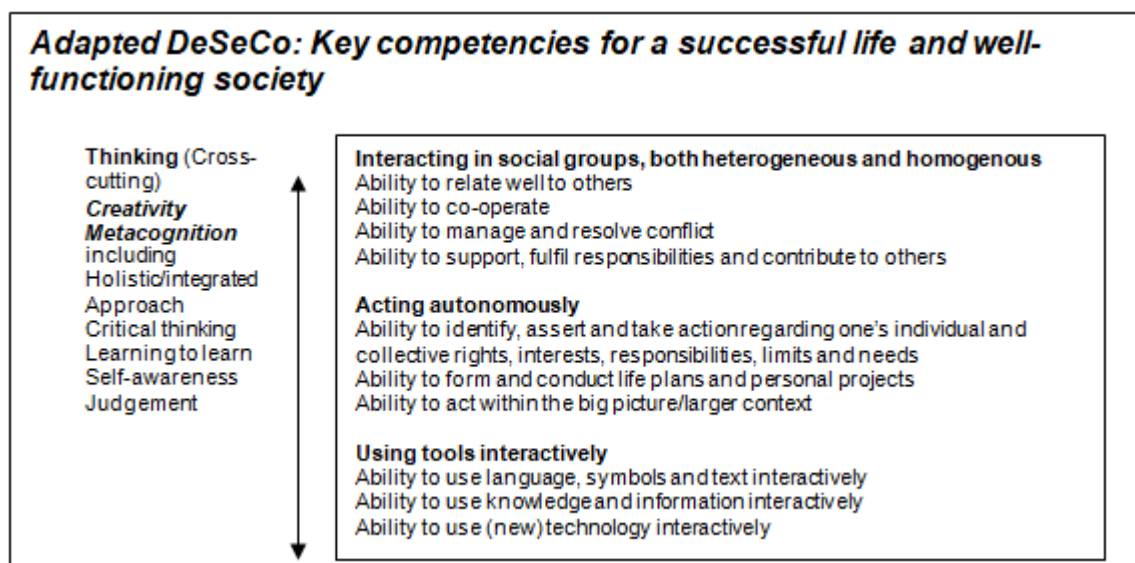
⁴ This model and the accompanying text are copied from page 4 of the DeSeCo Executive Summary:
<https://www.oecd.org/pisa/35070367.pdf>.

application of the Essential Skills in the different Essential Learning Areas (ELAs) of the 1990s curricula. As a result MOE was interested in reducing the many listed skills to a smaller grouping, similar to that produced by DeSeCo, and with a similar rationale. The first commissioned paper noted that:

This approach lifts the essential skills out of detailed lists of ‘what’ to a higher level of overall groups of skills that better indicate why these skills are important (i.e. ‘what for’) (Brewerton, 2004a, p. 5).

As well as academic papers, this paper drew on the outputs of a number of consultation processes. Employers were among the groups consulted and there was an explicit focus on future societal and economic developments generated by the “Catching the knowledge wave” conference held just after the turn of the century.⁶ The overall analysis resulted in the production of a grouping for NZC that was similar to the DeSeCo key competencies but that also took account of cultural influences seen to be important in the New Zealand context. These included a focus on: communal learning, not just “an unduly individualistic approach” (p. 12); competencies needed for supporting and contributing to the well-being of others, including family; and a more explicit development of ‘thinking’ that included “metacognition (thinking about thinking), reflectivity and creativity” (p. 12). The adapted model is shown in Figure 2.

Figure 2: Model taken from a commissioned policy paper (Brewerton, 2004a, p.12).



Having tested the applicability of the DeSeCo initiative in the New Zealand context, an analysis and synthesis exercise was undertaken to align the aspects of key competencies named in Figure 2 with the Essential Skills of the 1990s curricula. This exercise also took account of the desire for continuity with *Te Whāriki*—at the time the comparatively new curriculum for early childhood—and other policy developments that were underway concurrently. These included early thinking

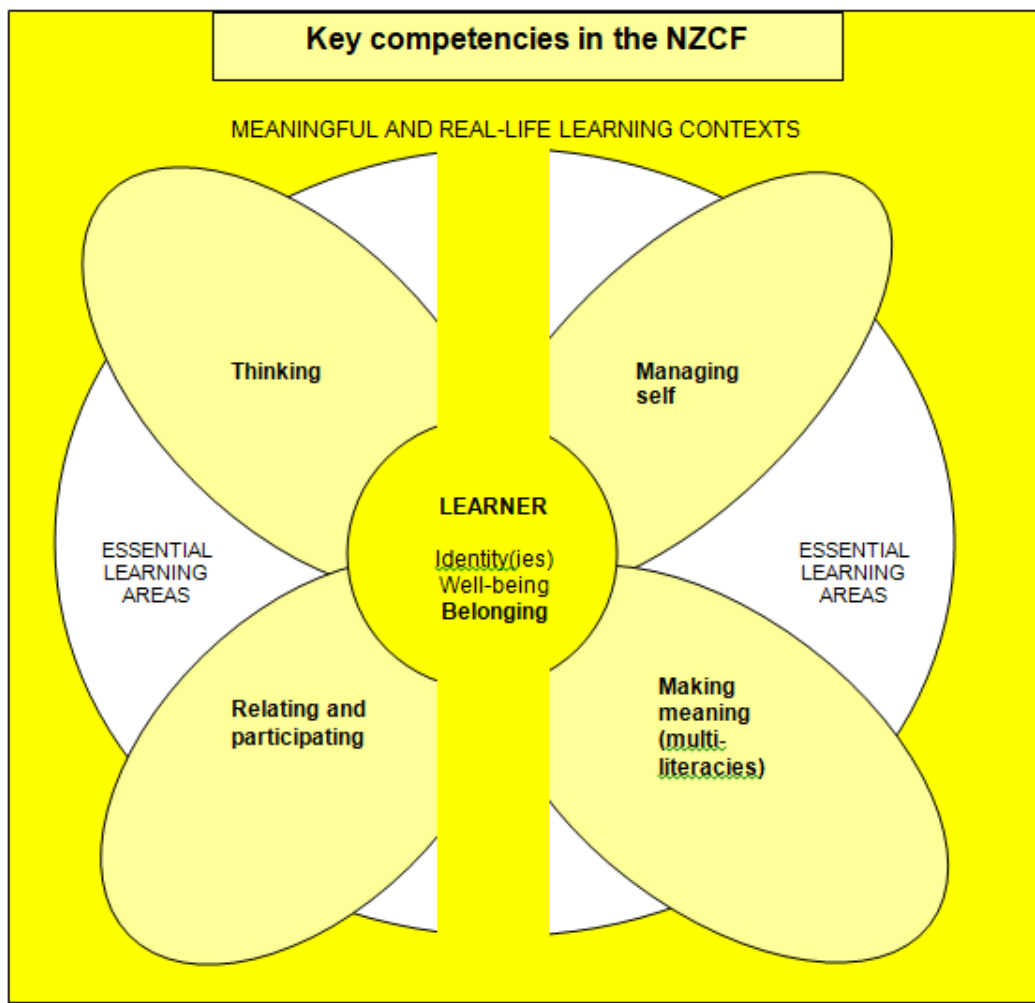
⁵ Brewerton, M. (2004a). Reframing the Essential Skills: Implications of the OECD Defining and Selecting Key Competencies Project: A background paper. This paper is archived as per Footnote 4.

⁶ The press release from this conference can be accessed at: www.beehive.govt.nz/release/knowledge-wave-conference-statement-co-chairs

about a set of values for NZC and another policy paper that identified “future focused” themes that would be important when developing the final form of NZC.⁷ This additional stage resulted in the naming of four key competencies: *thinking; relating to others; self-management (or independence); and language, literacy and numeracy (or using language, symbols and technology)*.

Towards the end of 2004 a summary paper was produced to support discussion of the proposed set of NZC key competencies.⁸ Figure 3 provides evidence that the initial model was already evolving as the working party convened by MOE⁹ debated the recommendations of the initial paper.

Figure 3: The model in late 2004 (Brewerton, 2004b, p.4). (The colour is original.)



⁷ This paper was written by MOE. It is not included in the archives but is referenced by some authors of the archived papers. For example Barker, Hipkins and Bartholomew (2004) list the six future focused themes identified in this paper as: social cohesion; citizenship; education for a sustainable future; bicultural and multicultural awareness; enterprise and innovation; and critical literacy (p. 5). <http://nzcurriculum.tki.org.nz/Archives/Curriculum-project-archives/References#b>

⁸ Brewerton, M. (2004b). Thoughts on what students need to learn at school: Summary for discussion purposes. <http://nzcurriculum.tki.org.nz/Archives/Curriculum-project-archives/References>

⁹ This was a large working party with a membership that represented many different organisations with an interest in the national curriculum (e.g. principals’ groups, unions, etc.).

Several new terms appear in the version in Figure 3: identity(ies); belonging; multi-literacies; and participating. These additions reflect the debate taking place at the time, both within a small working group tasked with refining and finalising the names and descriptions of the key competencies, and within the wider curriculum reference group. This model was dubbed the “daisy” model. It reflected ideas from sociocultural theory and showed the influence of the alignment with *Te Whāriki*. This is most evident in the concept of ‘belonging’ and the explicit recognition of the importance of building positive identities as learners.¹⁰ Around this time a fifth key competency was added to the original set. Initially this was called “belonging” but the argument was made that changing this to *participating and contributing* would allow sociocultural thinking about the distributed and active nature of learning to be more explicitly signalled.¹¹

The 2004 summary paper made explicit reference to the importance of weaving key competencies and learning area content through each other. Figure 4 shows how this idea was illustrated. Notice that in this model the contested ideas of belonging and identity have been taken out of the key competency mix. Their new placement in the centre of the weaving signals that they were now seen as emergent across the whole curriculum, assuming sufficiently skilful and meaningful weaving had been carried out. One other change to note is that *using language, symbols and technology* has evolved into *making meaning*. This change was also contested, with some people equating meaning-making with understanding, which has always been an important aim of teaching and learning. Eventually this key competency came to be called *using language, symbols and texts*.

The titles eventually agreed for the key competencies can be seen in Figure 5 which shows the “integrating graphic” used in the draft version of NZC, published for consultation in 2006. In the model in Figure 5 the notion of weaving has been replaced by one of “nesting”. Notice that the contested ideas about identity and belonging have now evolved into descriptions of learners who are “confident; connected; actively involved; and lifelong learners”, i.e. in this model these concepts have become part of the overarching vision for the curriculum rather than explicitly linked to the key competencies (see *NZC*, p. 8).

In this model the weaving idea has moved into the background. Instead the focus is on how all the new features from the front part of *NZC*, including the key competencies, are embedded in the learning areas.

¹⁰ Papers contributed to the working group by Margaret Carr, who led the original development of *Te Whāriki*, show how this emphasis shaped debates about the nature of key competencies, how they differed from the essential skills, and implications for learning and for curriculum development. These papers can be accessed via the TKI archive: <http://nzcurriculum.tki.org.nz/Archives/Curriculum-project-archives/References>

¹¹ Carr, M. (2004) *Key competencies/skills and attitudes: a theoretical framework*. This background paper was prepared for internal use by MOE and is not included in the archives on TKI.

Figure 4: An early model of ways to weave the parts of NZC together (Brewerton, 2004b, p.7).

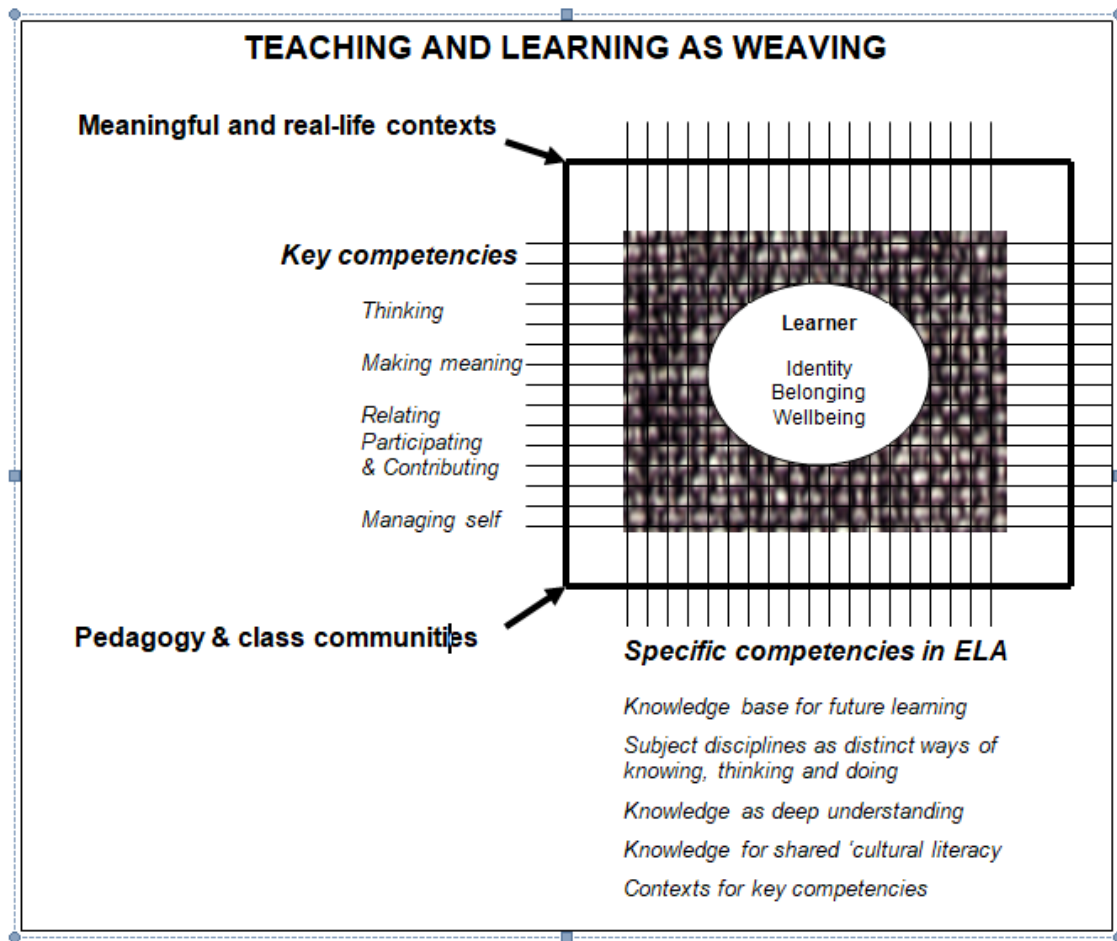
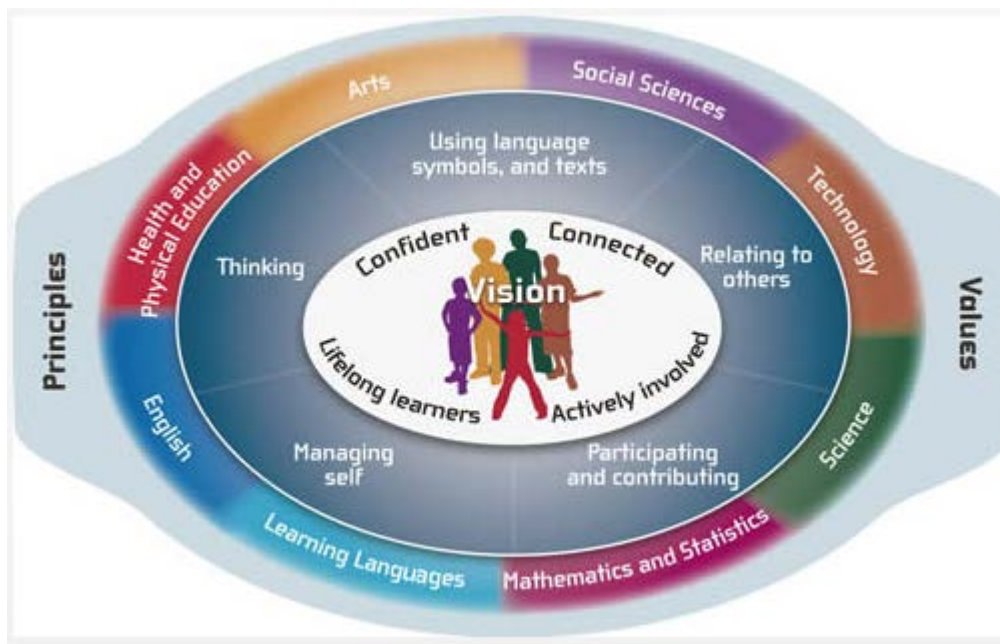


Figure 5: The “integrating graphic” included in the 2006 draft version of NZC



The graphic in Figure 5, which came to be dubbed the “tray” diagram, was not included in the final version of NZC, published in late 2007. In that version it was replaced by a different graphic which included all the elements from the front part of NZC and set these in the context of the broader regulatory environment for the curriculum (i.e. the “guidance” strand in the diagram below). This version is shown in Figure 6.

Figure 6: The final model for how the parts of NZC fit together.¹²



¹² This appears on p. 7 of NZC, where it is called an “overview”.

Alignment between NZC key competencies and other models

The outline above can only hint at the complex mix of interests and challenges being managed by MOE as the curriculum development process unfolded over time. NZC was eventually published in draft form in 2006 and widely circulated for feedback and critique.¹³ A final version that took this feedback into account was published in 2007.

Table 1 contrasts the final names given to the NZC key competencies with their DeSeCo counterparts.¹⁴ These are best matches, rather than one-to-one equivalents because NZC eventually settled on five key competencies to the OECD's four. Note the different positioning of thinking. In NZC it has the same stand-alone status as the other four key competencies, whereas OECD positioned this as "cross-cutting".

Table 1: Comparing OECD and NZC key competencies¹⁵

	Name given to competency by OECD	New Zealand Curriculum version
Thinking (cross-cutting)	Acting autonomously	Managing self
	Functioning in socially heterogenous groups	Relating to others Participating and contributing
	Using tools interactively	Using language, symbols and texts
		Thinking (not identified as cross-cutting)

There is another alignment to note in this brief outline of the development of the key competencies in NZC. At the time the curriculum was released an attempt was made to illustrate how the key competencies aligned with both *Te Whāriki* and potential tertiary study, so that alignment was evident across the whole education sector. Figure 7 shows this alignment model, as presented in materials that accompanied the release of NZC to schools.

Notice that belonging again appears on this model, and that the anticipated alignment was to the key competency added to NZC, i.e. *participating and contributing*.

¹³ Summaries of the consultation feedback are also included in the archive:
<http://nzcurriculum.tki.org.nz/Archives/Curriculum-project-archives/Consultation-and-feedback/Reports-and-analyses>

¹⁴ This table was first published in Hipkins, R., Bolstad, R., Boyd, S. & McDowall, S. (2014) *Key Competencies for the Future*. Wellington: NZCER Press, p. 14.

¹⁵ Justine Rutherford, a policy adviser in MOE at the time NZC was being developed, documented some of the important debates that took place, including the debate about how to position thinking in the overall model: Rutherford, J. (2005). Key competencies in the New Zealand curriculum development through consultation. *Curriculum Matters*, 1, 209-227.

Figure 7: Cross-sector alignment diagram¹⁶



Exploring the relationship between key competencies and traditional school subjects

In the final version of *NZC* the key competencies were defined as “capabilities for living and lifelong learning” (*NZC*, p. 12). This definition implied an alignment with the vision statement for all young people to be and become “confident, connected, actively involved lifelong learners” (p. 8) and with the set of principles for curriculum design, one of which is “learning to learn” (p. 9). Paper 2 in this series discusses how this idea of key competencies as capabilities has evolved over the decade since *NZC* was first published.

As Paper 2 will show, the dynamics of the relationship between key competencies and the learning areas was central to the evolution of the idea of capabilities. In *NZC* the expanded description of the key competencies noted that “they are not separate or standalone. They are the key to learning in every learning area” (p. 12). This statement implies a weaving together of key competencies and learning area content but the how and the why of that weaving were not specified in any detail. The two-way relationship was being tentatively explored, as briefly outlined next.

¹⁶ <http://youthguarantee.net.nz/vocational-pathways/guidance-for-educators/key-competencies/> Note that this diagram is now hosted by the Youth Guarantee initiative, and hence the accompanying notes have an emphasis on employability rather than the contribution that a tertiary education might make to the development of key competencies per se.

Developmental work on the key competencies was informed by commentaries commissioned from different teams of subject experts. Many of the subject-specific papers archived in the curriculum development section of TKI make no reference to the key competencies. However, some papers did specifically discuss the fit between the idea of key competencies and the broader challenges facing a specific learning area as the curriculum was being redeveloped. The following account provides a brief overview of the papers that do discuss key competencies. The papers themselves are summarised in the Appendix.

In general, the commissioned learning-area commentaries identify good alignment between the broader key competencies agenda and debates about learning that were current in the relevant learning area at the time that *NZC* was being developed. Many of the authors took the opportunity to use key competencies to bolster arguments about the important contribution their learning area might make to an overall education, or to argue for changes from traditional practice. Specific examples are included in the Appendix. While some cautions and reservations are expressed in the various papers, the overall response in these subject-related commentaries was positive and forward-looking. There was a definite sense of a ‘future-focused’ emphasis.

Assessing key competencies

Several commissioned papers addressed the assessment challenge in anticipation of questions teachers might ask. A common theme of these early papers is that what is valued is what will be assessed, and that developing suitable assessment tools could help exemplify the intended scope and impact of key competencies for teachers. However, the papers also caution that valid and reliable assessment processes and tools will not be easy to design and use. The highly contextualised nature of demonstrations of competency makes both generalisations and standardisation problematic. Specific papers address the following questions:

Should School Entry Assessment (SEA) include a focus on key competencies?

The SEA was in the process of being developed when Margaret Carr and Cathy Wylie addressed this challenge.¹⁷ They reported back to MOE in June 2004, making several clear recommendations:

- Any SEA assessment tools or approaches should have a formative focus, supporting teaching and learning rather than reporting.
- Given the distributed nature of learning, *opportunities* for students to develop their key competencies (i.e. what teachers do) could be a valid assessment target and exemplars of good practice would be very useful for their professional learning.
- Pedagogical practices would need to change for meaningful integration of key competencies into classroom learning—they should not be an ‘add-on’ (p. 9). In particular, ways they integrate with literacy and numeracy should be exemplified, given the emphasis on these aspects of young students’ learning.
- The ‘learning stories’ approach developed for early childhood education could be used to support teachers to build portfolios of students’ competency demonstrations.
- SEA should not be used to assess transition—children should be given at least 3 months to settle in to school.

¹⁷ Their paper was included in the file of resources given to the curriculum team, but is not archived on TKI.

Later research on implementation of the key competencies (see the second paper in this series) shows that these recommendations were prescient.

How might key competencies be assessed within the overall school curriculum?

It was originally anticipated that this question could be addressed via a review of literature from elsewhere. When this proved not to be possible (the literature simply did not exist at the time) the team working on the commissioned paper drew on several similar assessment initiatives to identify approaches that might work and key issues to watch out for. This paper cautioned about the need for clarity in the purposes for which assessment was being carried out and suggested a suite of approaches that might be adapted to be broadly compatible with the intent of weaving key competencies into the curriculum: learning stories; portfolios; rich tasks; and learning logs or journals.¹⁸

The longer paper was subsequently summarised and adapted to create a pamphlet that was included in implementation packs for schools.¹⁹ The advice in this pamphlet was also prescient. It introduced the notion that students should be actively involved in assessment of their own learning if we are serious about supporting them to become lifelong learners. This idea was subsequently picked up in policy work when New Zealand's assessment strategy was updated.²⁰


¹⁸ The long version of the paper can be found at: www.nzcer.org.nz/research/publications/documenting-learning-key-competencies-what-are-issues-discussion-paper

¹⁹ This pamphlet is archived on TKI: <http://nzcurriculum.tki.org.nz/Archives/Implementation-packs/Assessing-key-competencies-Why-would-we-How-could-we>

²⁰ See the so-called DANZ report, archived here: <http://assessment.tki.org.nz/Assessment-in-the-classroom/Assessment-position-papers>


Appendix: Development of KCs in specific learning areas

Health and physical education

Burrows, L. (2005, June).  [Proposed key competencies and health and physical education in the New Zealand curriculum \(Word, 154 KB\)](#) . Paper prepared for the New Zealand Ministry of Education New Zealand Curriculum/Marautanga Project.


In this paper, the author explores how well the proposed key competencies would support the intent of the 1990s Health and Physical Education curriculum. This 1990s curriculum had brought together three different subjects (health, physical education, and home economics) in a radical departure from traditional subject-based divisions. Burrows noted that many teachers were still getting to grips with the implications of this new way of thinking about their work. She included the 'daisy' model as a point of reference and, with some caveats,²¹ was broadly supportive of the proposed KCs for NZC:

I think there is no question that the intent of the Health and Physical Education in the New Zealand Curriculum and the aims of the proposed key competencies sit well together in both a conceptual and practical sense—they are indeed a good 'match' (p. 16).

Street, P. (2006, October).  [Home economics education in New Zealand: A position statement \(Word, 150 KB\)](#) . Paper prepared for the Ministry of Education's New Zealand Curriculum Marautanga Project.

This paper provides a justification for the importance of home economics as a specific subject under the umbrella of the health/PE learning area of NZC. Again the paper is broadly supportive of the opportunities key competencies present:


Home economics learning experiences enable students to develop competencies, making connections between their daily lives and their future world, and to strengthen their understanding of the interconnectedness of dependence, independence and interdependence within families and society (p.11).

Tasker, G. (2006, August).  ['It makes you think outside the square' – Examining the relationships between students' perceptions of their learning in senior secondary health education, the proposed key competencies, the schooling strategy 2005–2010 and learning in the knowledge rich \(Word, 134 KB\)](#) .

This paper has one interesting difference from the others discussed here. It reports on students' perceptions about their learning in health, linking their ideas to the proposed key competencies. Like the other two papers commissioned for this learning area, Tasker directly tackles the status of health as a subject, seeing the addition of key competencies as valued confirmation of the important work already being done by health teachers.

²¹ Like other physical education teachers at the time, Burrows was critical of the absence of an explicit reference to physical competencies in the overall key competencies model.


The arts

O'Connor, P., & Dunmill, M. (2005, August).  [Key competencies and the arts in the New Zealand curriculum \(Word, 89 KB\)](#). Paper prepared for the Ministry of Education's New Zealand Curriculum Marautanga Project.

Like health and physical education, the 1990s curriculum document for the arts brought discrete subjects together within a common conceptual framework that was radical when first released. Both these 1990s curricula were underpinned by explicit theoretical models that were seen to sit well with the sociocultural framing of key competencies. This paper is also broadly supportive of the proposed further developments to curriculum thinking and, like the languages paper below, takes the opportunity to make the case for the importance of the learning area within the overall curriculum:


The arts provide a rich and meaningful context for the development of the five key competencies. Arts educators find no difficulty in recognising their central contribution to the development of key competencies. They recognise the unique contribution the arts make to meaning making, to the development of arts thinking, of classrooms where teachers and students co create art and new knowledge. “We can see you but can you see us?” may be the key question as the competencies are refined (p. 8).

Learning languages

Crabbe, D. (2005).  [The essence of learning second languages in the New Zealand school context \(Word, 80 KB\)](#). Paper prepared for the Ministry of Education's New Zealand Curriculum Marautanga Project.

As part of NZC's development, the learning of additional languages was separated from English and became the eighth learning area of NZC. In that context, this paper mostly discusses the important benefits of second language learning. However, it also includes an interesting analysis of opportunities that second languages provide for developing key competencies, concluding that:


Second language learning has a unique contribution to make to the development of the generic key competencies. Thinking about another language and making meaning out of unfamiliar linguistic forms and cultural behaviour is to throw light onto one's own language and culture. Relating to others through different symbols and patterns of communication is the greatest communication challenge. Successfully managing oneself to develop a facility for human language that came easily the first time is a rewarding experience that enables students to participate in communities other than their own (p. 9).

Scarino, A. (2005, October).  [Learning languages in the New Zealand curriculum \(Word, 173 KB\)](#) . Paper commissioned by the New Zealand Ministry of Education for the New Zealand Curriculum Marautanga Project.

This second paper from the Learning Languages context is also supportive of the addition of key competencies to the curriculum. Scarino added several provisos for additional work that should be undertaken as the NZC was being fleshed out. She noted that it would be important to consider key competencies as *holistic* complexes of knowledge, skills, attitudes and values and to think carefully

about the way they would be manifested and developed in learning languages achievement objectives, and the way they would be represented in the essence statement for the languages area (p. 17).

Science

Barker, M., Hipkins, R., & Bartholomew, R. (2004, July).  [Reframing the essential skills: Implications for and from the science curriculum \(Word, 94 KB\)](#) . A commissioned research report for the Ministry of Education, Wellington.

The curriculum stocktake that laid the groundwork for the development of *NZC* prompted debate about how the *Nature of Science* (NOS) component of the curriculum should be redeveloped. This theme was picked up in a commissioned paper that scoped possible alignment of NOS and key competencies. As already noted, this paper also discussed the “future-focused themes” in the context of purposes for meaningful science learning. As was the case for the generic discussion of key competencies, the authors noted the important implications of locating new curriculum work in a sociocultural theoretical framing:

... recent years have seen a highly significant socio-cultural turn in the orientation of science education internationally. Science competencies now need to address not just questions of thinking, but also questions of being—issues of belonging, ownership, cultural identity; and questions about the kind of world one wants to live in and, ultimately, the kind of person one wants to be. These will almost certainly be needed in the science education of the future (p. 8).

The concluding statement for the paper (p. 10) reiterates these ideas, with the clear implication that the key competencies provided an opportunity for rethinking purposes for learning science.

Technology

Several papers were produced to support this learning area but those archived on TKI do not discuss key competencies. The paper referenced next was included in a ‘package’ of resources given to the team that worked on the final form of the key competencies in the curriculum. It is not clear why it was not included in the e-archives.

Compton, V. (2004, June). *Key competencies and technology education: Briefing paper prepared for the New Zealand Ministry of Education Curriculum Project*

The main focus of this paper is on the ‘citizenship’ purpose envisaged for technology education in *NZC*. As for the learning areas already discussed, Compton said there was a good fit between the OECD’s DeSeCo approach and the theoretical thinking that was being used to frame technology education at the time: “Both serve to challenge and support the development of students to become empowered to take a significant role in a multifaceted, complex and changing world” (p.7).

Social studies

Again, several papers were produced to support this learning area but those archived on TKI do not discuss key competencies. The paper referenced next was also included in the package of resources given to the team that worked on the final form of the key competencies in the curriculum.

Hunter, P. (2005, February). *Essential skills, key competencies and the Social Sciences Tikanga-A-Iwi learning area in the New Zealand Curriculum*.

Hunter notes that the “social sciences learning area values the dynamic of skills, knowledge, values, and social participation” (p. 19) involved in social inquiry, problem solving, decision-making etc. In several places the suggestion is made that social science teachers were already developing the competencies envisaged for *NZC* and hence these would be readily accepted by social studies teachers. However, she did caution that specific materials that illustrated the key competencies in action inside the learning area would be needed:

The pertinent question then is *how* the holistic and organic body of key competencies can guide learning, collection and selection of evidence-based learning, reporting of learning outcomes and achievements in the social sciences learning area. We need to keep firmly in our minds that it is teachers and learners who will make this happen (p.2 2, emphasis in original).