

Tall Poppies

Magazine of the New Zealand Association for Gifted Children

Vol 42 No. 1 March 2017



Gifted children's friendships
NZCGE: Lifting the learning ceiling
Procrastination and gifted learners
Gearing up for the GiftEDnz roadshow!

THEIR FUTURE - OUR CHALLENGE

Lifting the learning ceiling:

a framework for achieving deep, complex, abstract and transferable understandings

by Anna Meuli

A focus on how to achieve depth of knowledge has dominated education research and development over the last five to six decades with many researchers, theorists and educationalists proposing a variety of taxonomies, models and conditions of learning to suit (eg Bloom, Engelhart, Furst, Hill & Krathwohl, 1956; Biggs & Collis, 1982; Anderson & Krathwohl, 2000; Erikson, 2002; Wiggins & McTighe, 2005; McKenzie, 2005; Van Tassel-Baska, 2008; Hattie, 2012; Erikson & Lanning, 2014; Hattie & Donoghue, 2016). Some key components are ever present: there is movement of learning from surface to deep, simple to complex, concrete to abstract, contextual to conceptual, known to unknown, teacher-led to increased student agency.

Introducing the Framework for Depth and Complexity

The Framework for Depth and Complexity builds on and draws together the thinking and intent of the various models and strategies proposed by the educationalists listed above. The Framework is attributed largely to the work of Sandra Kaplan and Bette Gould (see California Department of Education, 1994; Kaplan & Gould, 1995, 2000) and acts as a vehicle for teachers and students to plan for and achieve deep, complex, abstract and conceptual learning outcomes.

'Depth refers to studying something from the concrete to the abstract, from the familiar to the unfamiliar, and from the known to the unknown. Depth requires students to examine topics by determining the facts, concepts, generalisations, principles, and theories related to them.' (CDE, 1994, p20).

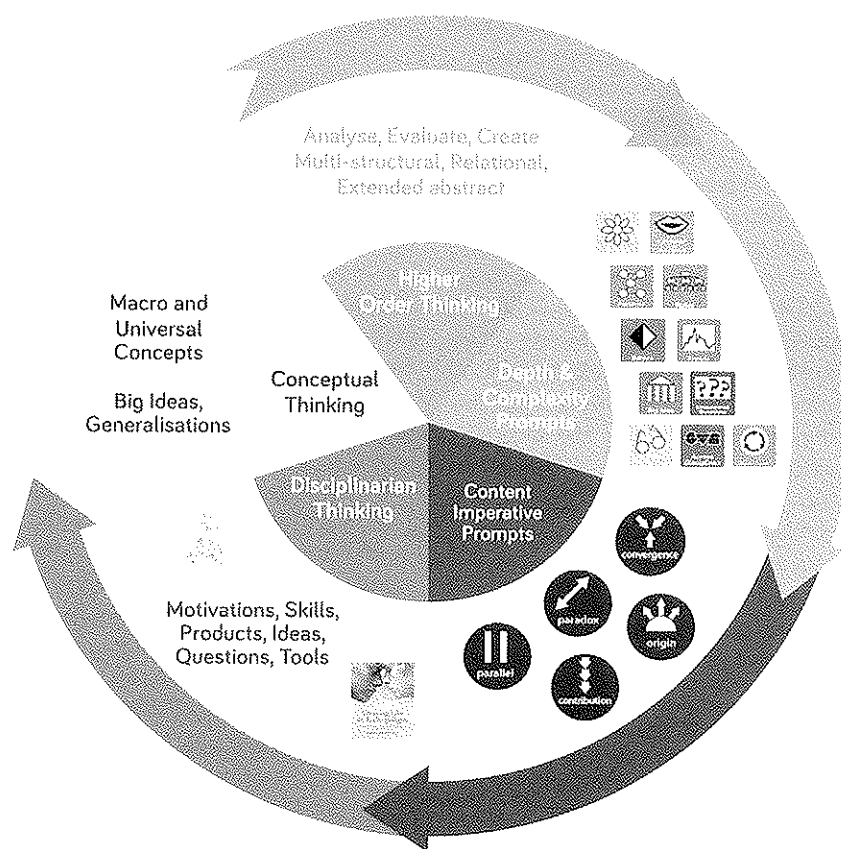


FIGURE 1: THE DEPTH AND COMPLEXITY FRAMEWORK

'Complexity involves making relationships between and among ideas, connecting other concepts, and layering an interdisciplinary approach that connects and bridges to other disciplines.' (CDE, 1994, p22)

The Framework, as shown above, consists of five key components: Higher Order Thinking Skills; Depth and Complexity Prompts; Content Imperative Prompts; Disciplinarian Thinking; and Conceptual Thinking.

The Framework, designed to build in-depth comprehension, aims to illicit higher level responses from students not just in the concrete or contextual but also in the abstract or conceptual.

While each component can be employed in isolation to add depth and complexity, the real power of the Framework is realised when the components are brought together and used in conjunction to build depth and complexity.



Higher Order Thinking

In contrast to lower order thinking, Higher Order Thinking requires the ability to consider relationships, effectiveness, possibilities and probabilities. It requires learners to create connections, synthesise and project into the unknown. Higher order thinking has been well documented through the development and implementation of various taxonomies such as Bloom's original and revised taxonomy and the SOLO taxonomy of Biggs & Collis in 1982. Verbs to guide the construction of learning objectives and thinking maps to help guide the process have all helped teachers and students to increase the level of complexity of learning and to better understand the kind of thinking process skills that underpin higher order thinking.

As we know, higher level thinking requires sufficient content knowledge to be effective. The prompts provided in the second and third components of the Depth and Complexity Framework help to achieve the level of content knowledge needed for higher order contextual thinking, and also provide the base from which one can springboard into abstract and conceptual thinking.

Depth and Complexity and Content Imperative Prompts

The Depth and Complexity and Content Imperative Prompts were developed by Dr Sandra Kaplan and Bette Gould under the auspices of the Office of Educational Research and Improvement (OERI), Javits Curriculum Project T.W.O., 1996, 1999.

The Depth and Complexity Prompts were developed in response to the question 'What content or knowledge distinguishes individuals

who are expert in a field of study?' Kaplan and Gould proposed that expert knowledge is both deep and complex and is built up over time. In-depth knowledge extends beyond having a mastery of the specialist language of a discipline and an array of factual detail to include knowledge of rules, patterns and trends, ethical issues, unanswered questions, and big ideas. Complex knowledge consists of knowledge about relationships and connections (eg how things have changed over time, what different perspectives are held, as well as how one discipline connects to others). When students think while using these tools, they learn to approach subjects from the point of view of an expert. In doing so, they will understand concepts in a deeper and more complex way.

Subsequent research found that the depth and complexity prompts illicit both critical thinking, as well as thinking that is practical to a discipline. Experts and professionals interviewed in the study revealed their ability to relate each prompt of depth and complexity to their discipline and the ways they conceptualised and accomplished their scholarly work. They used absolute terms such as *always*, *everywhere*, *all the time*, and *constantly* to describe the relevance of the depth and complexity prompts to their discipline.

The Content Imperative Prompts were developed to stimulate even greater depth and complexity of understanding. The prompts look to identify origins, contributions, parallels, convergence and paradoxes within subject matter.

The relationship of the content imperatives to the dimensions of depth and complexity is significant. Each set of prompts strengthens students' abilities to focus on and investigate knowledge at more

advanced and sophisticated levels. When used in tandem with the dimensions of depth and complexity, the content imperatives provide specificity to those dimensions. For example, one could work towards greater depth of knowledge by identifying trends (D&C prompt) within the subject matter, or alternatively one could go even further and investigate the convergence (CI prompt) of trends. One could identify multiple perspectives (D&C prompt) within subject matter or go further and investigate the origins (CI prompt) of the multiple perspectives identified.

The depth and complexity prompts illicit both critical thinking, as well as thinking that is practical to a discipline

Disciplinarian Thinking

Through the use of depth and complexity prompts, learners are enabled to identify and consider perspectives, ideas and disciplines. Disciplinarian Thinking further increases complexity in learning for students by moving them from their realm of experience and into the realm of the expert and the disciplinarian. In identifying the tools, rules, methodologies, skills and research and development interests various disciplinarians use and are motivated and governed by, students are enabled to consider content from disciplinary perspectives and to identify what it is to think like a disciplinarian. Inevitably they begin to create the platform for cross disciplinary ideas to emerge.

Through the immersion of the components of the depth and complexity framework introduced thus far, students are empowered with sufficient content knowledge to engage in higher order thinking. However, the framework aims to lift the learning ceiling further by having students move on to engage in abstract and conceptual thinking.

Conceptual Thinking

True abstraction exists in thought or as an idea, not having a physical or concrete existence. True abstraction requires engagement in concepts and ideas that transcend and connect multiple contexts by requiring the

learner to think conceptually. Conceptual Thinking requires the ability to consider the intangible and the 'big picture'.

There is movement within the field of education to plan around concepts and big ideas. In New Zealand schools, for example the IB (International Baccalaureate) schools, it is becoming more common to see the inclusion of concepts and big ideas/enduring understandings/essential questions as overarching foci within teacher planning for inquiry learning.

This component of the Framework seeks to lift the learning ceiling for students by having them move from lower level conceptual consideration to higher level conceptual thinking. Students may work to build their knowledge of a concept by considering it and some of its associated big ideas across multiple contexts, or they may critique other people's big ideas over time, determining if they are generalisations or not. They might also identify concepts themselves and construct big ideas of their own to test out, or they may explore the connections between concepts. For example, no longer are students thinking about 'water ways' but, using conceptual thinking, they may now be exploring 'systems' and 'change'. No longer are they considering the effects of dairy farming on water contamination, but they may now be thinking about the evolutionary and revolutionary nature of change, or how systems have parts that work together. Or they may be considering the relationship and connections between systems and change.

Conceptual thinking enables students to move from the concrete and lower level to the abstract and higher level in both content and in process.

Benefits

- This Framework pulls together the key aspirations of the various educational developments listed at the start of this article.
- When looking to truly lift the learning ceiling, the Framework achieves the kind of depth, complexity, abstraction and higher order thinking that excites both student and teacher alike.
- It facilitates accelerated learning, giving students in the primary sector access to

the kind of thinking anticipated and rewarded in the secondary sector.

- And of ultimate importance, the Framework makes this kind of learning visible and accessible to both the teacher and the learner.

Local Implementation

In seeking to ensure deep, complex, abstract and transferable understandings in learning for its students the New Zealand Centre for Gifted Education (NZCGE) draws upon The Framework for Depth and Complexity to guide the process of learning in all its programmes.

As an essential part of the NZCGE Curriculum, educators find the framework to be incredibly beneficial in helping to achieve desired learning outcomes. NZCGE is also facilitating Professional Learning and Development opportunities for New Zealand educators in the use of the Framework.

Visit our website for more information at www.nzcge.co.nz.

'It is all very well to want depth and complexity but when you empower the students to understand those concepts in a practical way for themselves, you are much more likely to achieve them!'

Sue Bufton, Regional Lead Teacher NZCGE

'Before I started using these tools, I had a 'sense' of what depth of thinking looked like, felt like, sounded like... it was something I knew when I saw, but not something that I could articulate the meaning of, or actually specifically TEACH! This suite of tools has not only helped me to articulate what depth might actually be, but also to teach in ways that build depth. Students' own abilities to delve deeply into content, to make connections within and across content, and to skilfully differentiate for themselves have all been transformed, which results in learning that is not just effective, but is transformational.'

Madelaine Armstrong-Willcocks,
Regional Lead Teacher NZCGE

Anna Meuli is the Consultancy Manager for the New Zealand Centre for Gifted Education, specialising in both curriculum development for gifted learners and professional learning and development for educators.