THE SKILFUL THINKER

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Teachers of Thinking - Aotearoa Collaborative

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Cabinet of Curiosities

Designed to encourage curiosity the cabinet is set up in the school's library and a strange object is placed on display every week. Objects such as a meteorite, porcupine fish, Libyan desert glass, Mardi Gras mask from New Orleans, a silver dollar retrieved from under the World Trade Centre. The cabinet is placed near a set of iPads so the keywords on the object's label can be searched using Google. The front of the cabinet has a small letter box for students to post interesting facts about the object and go into a weekly draw for a small prize. For more information contact Richard at rcoote@bis.school.nz

CULTURE OF THINKING CONFERENCE

I have just returned from a very worthwhile 2 days at Bialik College, Melbourne, Australia. This is the 3rd time Bialik in collaboration with the Harvard School of Education has organised a conference on thinking. The conference theme was: Telling Our Stories of Learning: Who are our students becoming as thinkers and learners as a result of their time with us? During the conference I presented a session on Thinking-Based Learning and how Birkdale Intermediate School has developed our culture of thinking with a focus on using the Thinking Maps and Graphic Organisers developed by Robert Swartz. During the conference Ron Ritchhart, Mark Church and Karin Morrison launched their new book 'Making Thinking Visible.' I believe this to be one of the books that are essential reading for anyone wishing to develop their students skilful thinking. The authors were kind enough to allow me to take an extract from the book for this issue of our newsletter. Although there are many more exciting sections in the book this is the first time I have read such a clear explanation on why a taxonomy such as Bloom's is of little use when trying to improve our students skilful thinking and so thought it worthwhile to share with the Collaborative. EDITOR

BEYOND BLOOM

When we ask teachers to identify the thinking required in their lessons, we frequently get the response, "Do you mean Bloom's taxonomy? Is that what you're after?" Most teachers have learned about Benjamin Bloom in their teaching training courses. Although his taxonomy focused on three domains – affective, psychomotor, and cognitive – it is the cognitive domain that most teachers remember. Bloom identified a sequence of six learning objectives that he felt moved from lower-order to higher-order thinking: knowledge, comprehension, application, analysis, synthesis, and evaluation. However, these ideas were just a theory and were not based on research on learning. Nonetheless, they have become codified into the way many teachers are taught to think about thinking. Teachers are often admonished to make sure some of their questions or lessons require the "higher levels" of thinking, though generally this is taken to mean anything above comprehension.

Although Bloom's categories capture types of mental activity and thus are useful as a starting point for thinking about thinking, the idea that thinking is sequential or hierarchical is problematic. Bloom suggests that knowledge precedes comprehension, which precedes application, and so on. However, we can all find examples from our own lives where this is not the case. A young child painting is working largely in application mode. Suddenly a surprise color appears on the paper and she analyses what just happened. What if she does it again but in a different place? She tries and evaluates the results as unpleasing. Continuing this back and forth of experimentation and reflection, she finishes her work of art. When her Dad picks her up from school, she tells him about the new knowledge of painting she gained that day. In this way, there is a constant back and forth between ways of thinking that interact in a very dynamic way to produce learning.

In the 1990s, two of Bloom's former students revised his taxonomy, and a new list was published using verbs rather than nouns. However, the idea of a sequence was kept. Moving from lower to higher-order skills, Anderson and Krathwohl (2001) identified remembering, understanding, applying, analysing, evaluation and creating. Once again a potentially useful list, but it remains problematic if one takes it as a set sequence to guide instruction for learning. Looking at the thinking actions that Anderson and Krathwohl associated with these six, one might question whether the "testing" they say is involved in evaluating is really more difficult or higher order than the "describing" they list under remembering. For instance, looking carefully to notice and fully describe what one sees can be an extremely complex and engaging task. Such close observation is at the heart of both science and art. Analysis and speculation depend on careful noticing.

Our colleague, Steve Seidel (1998) has written about both the importance and challenge of description when looking at student work. Because the mind is designed to detect patterns and make interpretations, slowing it down to fully notice and just describe can be extremely challenging. In contrast, one can test the ability of a paper airplane to fly, the accuracy of a proposed mathematical algorithm, or the strength of a toothpick bridge pretty quickly and easily.

What these examples illustrate is that it makes little sense to talk about thinking divorced from context and purpose. Furthermore,

the idea of levels might best be considered with regard to the thinking itself. Rather than concerning ourselves with levels among different types of thinking, we would do better to focus our attention on the levels or quality within a single type of thinking. For instance, one can describe at a very high and detailed level or at a superficial level. Likewise, one can simply test something out to determine if it will fail, or one can fully test the limits and conditions of that failure. Analysis can be deep and penetrating or deal with only a few readily apparent features. Watch any major television news show and contrast it to the more in-depth stories one might hear on radio and see in print, and you will see different levels of analysis at play.

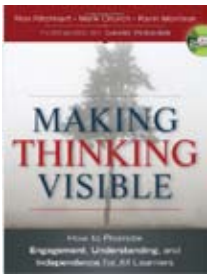
One can argue that there is a bit of category confusion in both of the Bloom's lists as well, since not all items seem to operate at the same level. This can most readily be seen in the way "understanding" is framed. Since the 1970s, many researchers and educational theorists have focused on the complexities of teaching and learning for understanding, as opposed to just knowledge retention (Bruner, 1973; Gardner, 1983, 1991; Skemp, 1976; Wiske, 1997). Some researchers have made the distinction between deep and surface learning (J.B. Biggs, 1987; Craik & Lockhart, 1972; Marton & Saljo, 1976). Surface learning focuses on memorization of knowledge and facts, often through rote practices, whereas deep learning has a focus on developing understanding through more active and constructive processes. Today, most educators would argue that understanding is indeed a very deep, or at least complex, endeavor and not in any way a lower-order skill as the revised taxonomy suggests (Blythe & Associates, 1998; E.O. Keene, 2008; Wiggins & McTighe, 1998). Indeed, understanding is often put forward as a primary goal of teaching.

Research into understanding, much of it conducted with our colleagues at Project Zero, indicates that understanding is not a precursor to application, analysis, evaluating and creating but a result of it (Wiske, 1997). Recall the brief illustration of the young girl painting mentioned earlier. The understanding or insight she develops into painting are the direct result of much and varied activities and the associated thinking that went along with those activities. Thus, we might consider understanding not to be a type of thinking at all but an outcome of thinking. After all, one cannot simply tell oneself to understand something or direct one's attention to understanding versus some other activity. Ellin Keene (2008) writes about the complexity of the process of understanding in the process of reading and the need to develop explicit thinking strategies to support those efforts. Likewise, James Hiebert et al. (1997) wrote about how learning mathematics for understanding is fundamentally a different task than memorizing procedures.

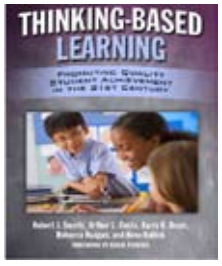
The same argument put forth about understanding – that it is a goal of thinking rather than a type of thinking – applies equally well to the process of creating. How does one go about the process of creating anything? It is not necessarily a single direct act but a compilation of activities and associated thinking. Decisions are made and problems are solved as part of this process. Ideas are tested, results analyzed, prior learning brought to bear and ideas synthesized into something that is novel, at least for the creator. This creation can be simplistic in nature, as with the child creating a new color; useful, as in the invention of a new iPhone app; or profound, such as new methods of producing energy from never before used materials.

As these brief critiques point out, the idea of levels is problematic when it comes to parsing thinking and ultimately less useful than one might hope. Thinking doesn't happen in a lockstep, sequential manner, systematically progressing from one level to the next. It is much messier, complex dynamic and interconnected than that. Thinking is intricately connected to content; and for every type or act of thinking, we can discern levels or performance. Perhaps a better place to start is with the purposes of thinking. Why is it that we want students to think? When is thinking useful? What purposes does it serve? We pick up on these issues in the following section of the chapter.

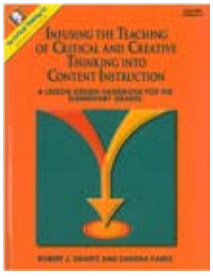
BOOKS WORTH READING



Making Thinking Visible by Ron Ritchhart, Mark Church and Karin Morrison, forward by David Perkins.



Thinking-Based Learning by Robert Swartz, Art Costa, Barry Beyer, Rebecca Reagan, and Bena Kallick, forward by David Perkins.



Infusing the Teaching of Critical and Creative Thinking into Content Instruction: A Lesson Design Handbook for the Elementary Grades by Robert J. Swartz and Sandra Parks.