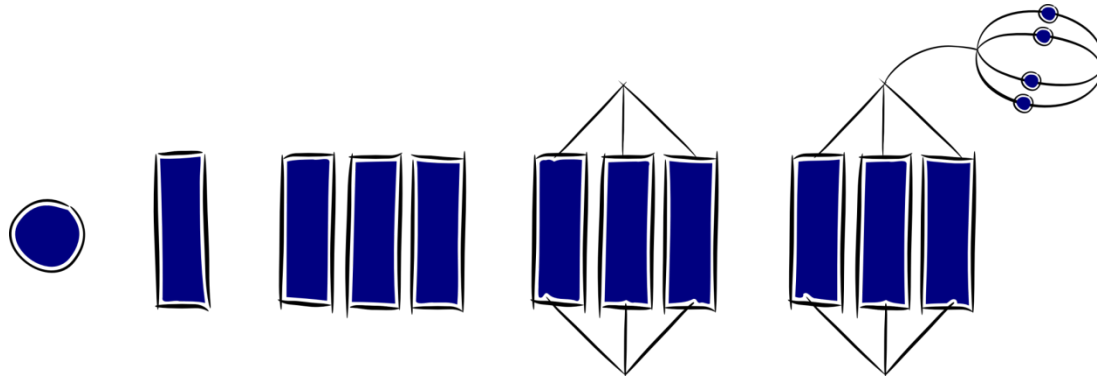


SOLO Taxonomy & Gifted Education

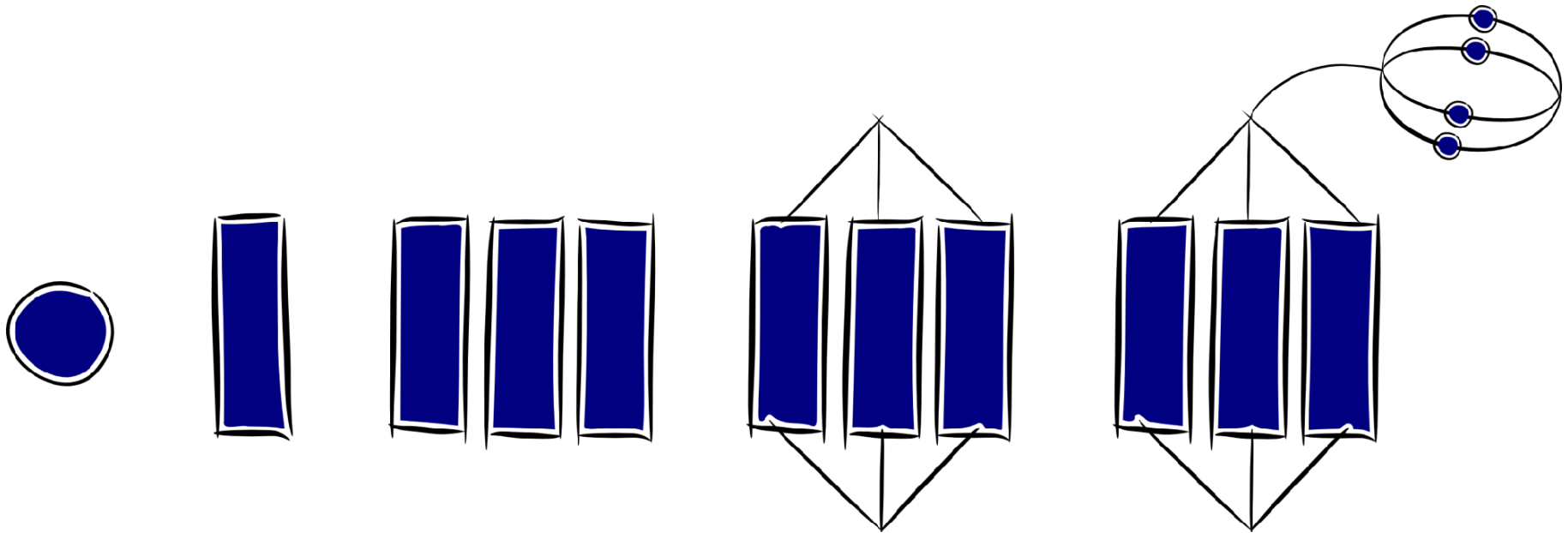
How SOLO Taxonomy as a model of learning, along with HOT Maps and self assessment rubrics, can help meet the learning needs of gifted students.

Pam Hook
www.pamhook.com



SOLO Taxonomy - Biggs and Collis 1982

The Structure of Observed Learning Outcomes



What do we know about
the learning needs of gifted students?

For a few decades, it's been noted that a large percentage of all gifted students (those who score in the top 10 percent on aptitude tests) severely underestimate their own abilities.

Po Bronson - New York Magazine February 19, 2007 <http://nymag.com/news/features/27840/>

“Those afflicted with this lack of perceived competence adopt lower standards for success and expect less of themselves.

They underrate the importance of effort, and they overrate how much help they need from a parent.”

Po Bronson - New York Magazine February 19, 2007 <http://nymag.com/news/features/27840/>



hooked
ON
thinking

www.hooked-on-thinking.com

Underestimate ability

Underrate importance of effort

Overrate how much help they need

Adopt low standards



hooked
ON
thinking

www.hooked-on-thinking.com

Po Bronson - New York Magazine February 19,
2007 <http://nymag.com/news/features/27840/>

.. this self-awareness that he's smart hasn't always translated into fearless confidence when attacking his schoolwork. In fact, Thomas's father noticed just the opposite. "Thomas didn't want to try things he wouldn't be successful at," his father says.

"Some things came very quickly to him, but when they didn't, he gave up almost immediately, concluding, 'I'm not good at this.' "



hooked
ON
thinking

www.hooked-on-thinking.com

Po Bronson - New York Magazine February 19,
2007 <http://nymag.com/news/features/27840/>

***What happens when students reframe
learning into:***

“Things I am good at and things I am not”



hooked
— ON —
thinking

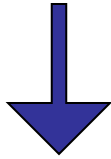
www.hooked-on-thinking.com

Po Bronson - New York Magazine February 19,
2007 <http://nymag.com/news/features/27840/>

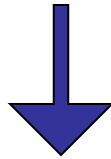
One line of praise study

Carol Dweck Stanford University Study - NY 5th Grade Classrooms

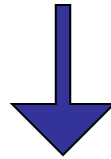
Non verbal IQ Test - easy



Students praised for intelligence OR effort



Then given a second test choice - Same or harder



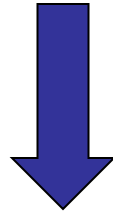
Significantly different responses.

One line of praise study

Carol Dweck Stanford University Study NY 5th Grade Classrooms

Next given an artificial failure test

Everyone failed



Different responses during test
between two groups.



hooked
ON
thinking

www.hooked-on-thinking.com

Blackwell, L., Trzesniewski, K., & Dweck, C.S. (2006). Implicit Theories of Intelligence Predict Achievement Across an Adolescent Transition: A Longitudinal Study and an Intervention. Child Development.

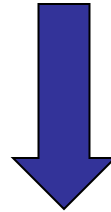
<http://news-service.stanford.edu/news/2007/february7/dweck-020707.html>

One line of praise study

Carol Dweck Stanford University Study - NY 5th Grade Classrooms

Final Test

Same level of difficulty as first test



“You must be smart” – down 20

“You must have worked really hard” - up 30



hooked
ON
thinking

www.hooked-on-thinking.com

Blackwell, L., Trzesniewski, K., & Dweck, C.S. (2006). Implicit Theories of Intelligence Predict Achievement Across an Adolescent Transition: A Longitudinal Study and an Intervention. Child Development.

<http://news-service.stanford.edu/news/2007/february7/dweck-020707.html>

“Emphasizing effort gives a child a variable that they can control.

They come to see themselves as in control of their success.”

Dweck 2007

“Emphasizing natural intelligence takes it out of the child’s control, and it provides no good recipe for responding to a failure.”

Dweck 2007

Giving kids the label of “smart” does not prevent them from underperforming. It might actually be causing it.



hooked
ON
thinking

www.hooked-on-thinking.com

Po Bronson - New York Magazine February 19,
2007 <http://nymag.com/news/features/27840/>

Do praise, self-esteem, and performance rise and fall together?

“The biggest disappointment of my career” Baumeister

“Having high self-esteem didn’t improve grades or career achievement. It didn’t even reduce alcohol usage. And it especially did not lower violence of any sort.”

When you feel that you are not in control ...

Risk adverse

Lack autonomy

Shorter task persistence

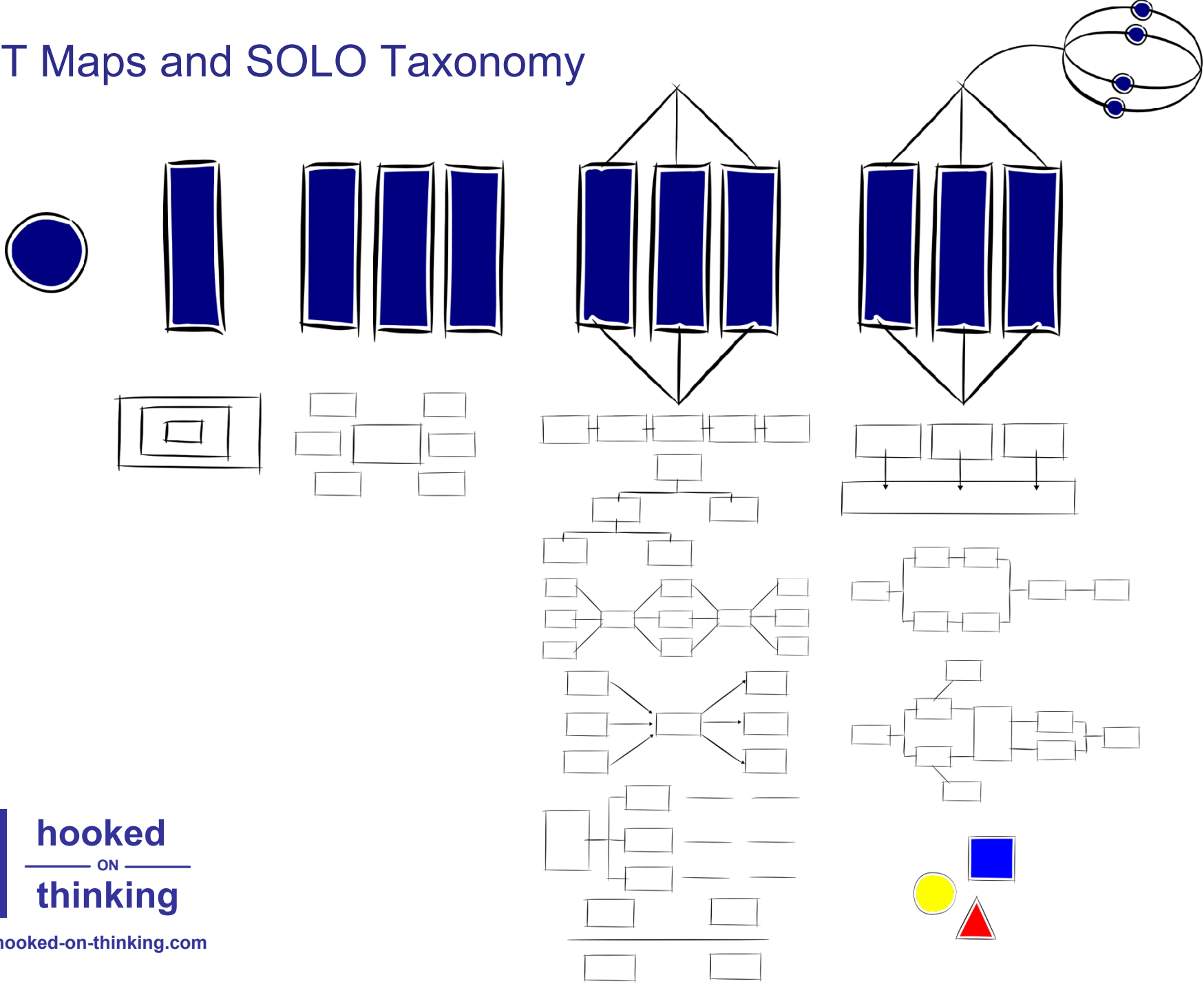
Anxious about where you are in relation to others

More interested in tearing others down

No strategy for handling failure - Lie and cheat

Handle transition into more competitive environments poorly

HOT Maps and SOLO Taxonomy



hooked
ON
thinking

www.hooked-on-thinking.com

Prof David Jesson York University.

Pupils rated among the brightest prospects at primary school go on to under-achieve at GCSE

Some do only nearly half as well as their peers in “good” schools.

Prof David Jesson York University.

Research study of 28,000 children who scored the highest marks in national curriculum tests of English and mathematics at the age of 11.

[i.e. The top 5 per cent from more than half a million pupils in England who take Key Stage 2 tests in primary schools each year.]



www.hooked-on-thinking.com

**Bright pupils let down by state schools –
High-achievers do better when grouped together, study reveals.**

The Times May 23 2005 http://www.timesonline.co.uk/tol/life_and_style/education/article525589.ece

Prof David Jesson York University.

*“When the same students took their GCSEs last summer, many had effectively been lost **because schools failed to push them to reach their potential.**”*

School Curricula Effects for Gifted Students

Influence	Effect Size
Acceleration	$d=0.88$
Enrichment	$d=0.39$
Ability Grouping	$d=0.30$

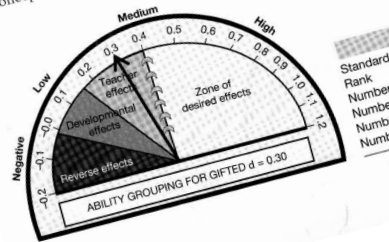
Students are retained in rather arbitrary and inconsistent ways, and those flunked are more likely to be poor, male and from a minority, although holding students back is practiced to some degree in rich and poor schools alike. The effects of flunking are immediately traumatic to the children and the retained children do worse academically in the future, with many of them dropping out of school altogether. Incredibly, being retained has as much to do with children dropping out as does their academic achievement. It would be difficult to find another educational practice on which the evidence is so unequivocally negative (House, 1989).

School curricula effects for gifted students

The school curricula effects discussed in this section relate to structuring differential curricula experiences for gifted and talented students within schools, such as ability grouping for gifted students, acceleration, and enrichment. Each of these is considered in turn below. In comparing results for the three methods overall, the most effective for influencing the outcomes of gifted students was acceleration ($d = 0.84$). This compares to $d = 0.39$ or enrichment and $d = 0.30$ for ability grouping—which leads to the question of why acceleration is the least implemented of the three.

Ability grouping for gifted students

It is important to separate gifted programs from high-ability tracks. The latter receive a faster pace of instruction and more challenging tasks within the same curriculum frameworks as medium- and low-ability students, whereas the former offer different curricula. Herein lies a key distinction. Where there is more likelihood at challenging students at the appropriate level then there is more likelihood in engagement and learning. For example, Kulik and Kulik (1984) found that grouping had a positive effect on the achievement of gifted and talented school students ($d = 0.49$). Goldring (1990) found that gifted students in special, homogeneous classes with challenging curricula, achieved more than their counterparts in regular classes. For students in special classes, the greatest advantage was in science and social science tests and the smallest were in reading and mathematics. There was no evidence of negative or differential social effects; there were no differences in self-concept or creativity for students in special classes and those in regular classes.



100 Visible Learning

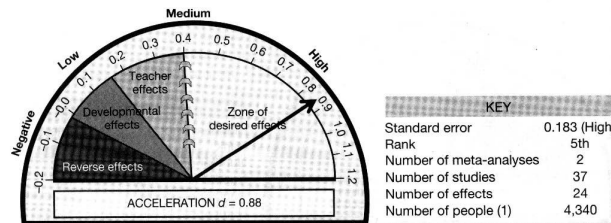
Feldhusen, and Asher (1991) found positive effects from various creativity programs ($d = 0.11$), achievement (reading and vocabulary; $d = 0.65$), or thinking ($d = 0.44$).

Acceleration

An alternative to special classes for gifted children is to accelerate student curricula: "Accelerated instruction enables bright students to work with peers on learning tasks that match their abilities" (Kulik & Kulik, 1984). This involves progress through an educational program at rates faster than is conventional (Pressey, 1949), although there are many options, including compacting or telescoping, and advanced placement. Kulik and Kulik (1984) found that accelerated students surpassed the performance of students of an equivalent age and intelligence by nearly one grade level. They revisited those studies that had some form of controlled comparison of accelerated students with same-age controls and found that those that compared accelerated students with older controls concluded that accelerated students did just as well as those to which they moved. He also noted that accelerated students had higher ambitions, and were no different in rates of participation.

George, Cohn, and Stanley (1979) reviewed the literature and concluded that there were no studies which have results over accelerative methods; at best, enrichment. The question is why there is so much resistance to acceleration. It is usually preconceived and irrational claims about social and cultural barriers to accelerated students, or some timetabling barriers. Kulik and Kulik (1984) found that students' attitudes towards schools seemed largely unaffected by instructional programs.

If acceleration is so successful then why is it one of least used methods for gifted students? The typical claim is that acceleration is not beneficial from social and interpersonal perspectives. In a meta-analysis directed at this question of the social effects, Kent (1992) found an average effect of only $d = 0.13$, in favor of gifted students in accelerated programs—if anything, there were positive social effects of acceleration and negative



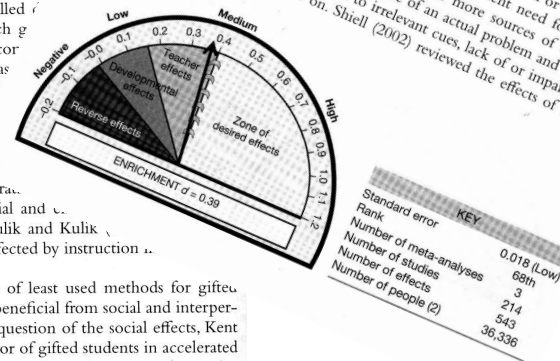
effects if not accelerated. There were few differences between methods of acceleration (telescoping was the highest effect, $d = 0.15$), or by sex (boys $d = 0.21$, girls $d = 0.15$). Instead, we may need to question the negative social impact on gifted students if they are not accelerated!

Levin (1988) asked, if acceleration is so beneficial for gifted students, why could it not also be used with non-gifted students so that they are able to perform at grade level by the end of elementary school. These programs involve high expectations, planning lines for meeting educational requirements, stimulating instructional programs, specified deadlines by all staff, and using all available community resources. The evidence, however, is limited from a meta-analysis standpoint: Borman and D'Agostino (1995) claimed Accelerated Learning had "highly promising evidence of effectiveness" although the overall effect size was only $d = 0.09$.

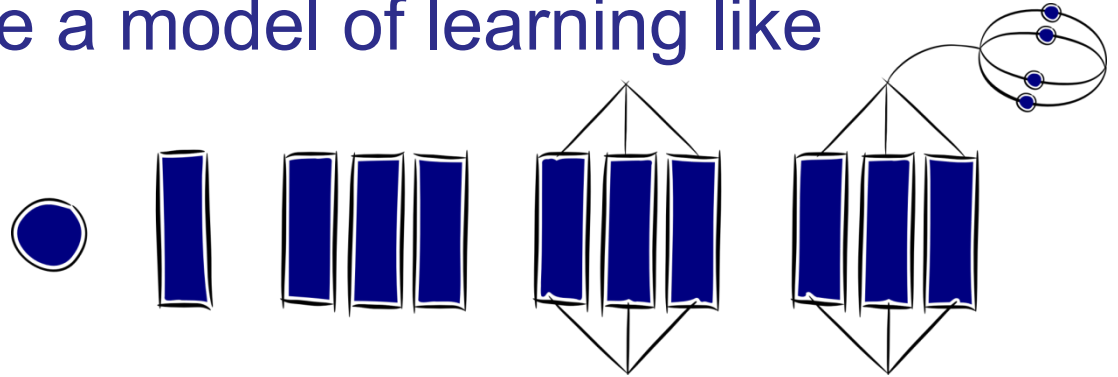
Enrichment

Enrichment involves activities meant to broaden the educational lives of some group of students (George *et al.*, 1979). Wallace (1989) reported that enrichment was stronger in mathematics ($d = 1.10$) and science ($d = 1.23$) than in reading ($d = 0.59$) or social studies ($d = 0.23$). Programs in which students mastered more mature ideas had higher effects than those with a broader investigation of the regular curriculum. Teachers with more limited experience ($d = -0.06$).

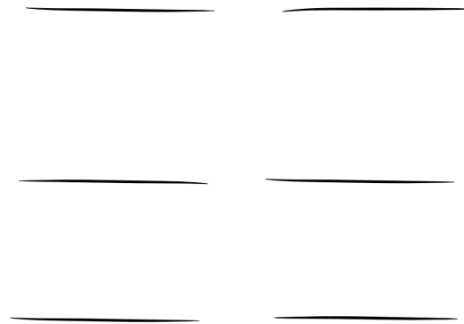
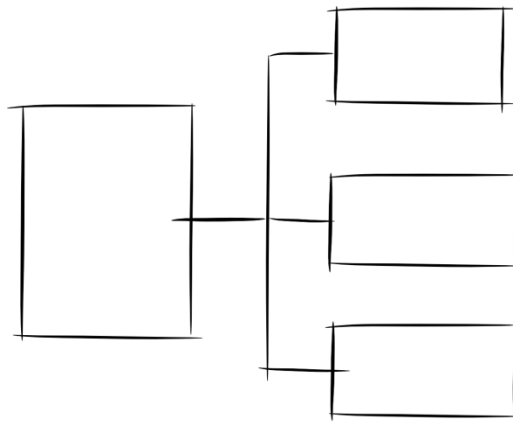
There are many forms of enrichment and one of the more common is Feuerstein's Instrumental Enrichment program (Feuerstein, 1980). These programs aim to teach lessons three to five times a week for two to three years. Each instrument concerns a specific cognitive deficiency such as blurred or sweeping perceptions, unplanned or impulsive behavior, lack of size, shape or quantity, deficient need for precision and accuracy, impaired capacity for considering two or more sources of information and once, inadequacy in experiencing the existence of an actual problem and then defining it, inability to select relevant as opposed to irrelevant cues, lack of or impaired need for pursuing logical evidence, and so on. Shiell (2002) reviewed the effects of Feuerstein's



When students have a model of learning like SOLO Taxonomy



supported by HOT Maps and self assessment
rubrics



HOT ANALYSIS (Part whole) Map &
Self assessment rubric

... they can set specific, proximal
and hierarchical learning goals

....and can take control of
their own learning,

... comparing their learning
performance to their learning goals

... and explaining their success
and failure in terms of their
learning strategies

Helping gifted students set specific, proximal and hierarchical learning goals

How can we help students better know themselves as learners ?

Common understanding the learning process

learned through

Key Competencies and SOLO Taxonomy

The New Zealand Curriculum identifies five key competencies that are "key to learning" : thinking/ using language, symbols, and texts/ managing self/ relating to others/ participating and contributing.

SOLO Taxonomy : Structured overview of student learning outcomes, Biggs and Collis 1982 identifies five levels of complexity in student learning outcome.

Common language of learning process

learned through

Language of instruction referenced to SOLO Taxonomy

Define, describe, compare contrast, sequence, cause and effect, part-whole, classify, analogy, predict, generalise, evaluate, create, reflect.

Common tools and strategies to enhance learning process

learned through

Learning interventions referenced to SOLO Taxonomy and the Key Competencies

Questioning frameworks, thinking strategies, visual mapping, Habits of Mind, think pair share, Information communication technologies, Web2.0 etc

Common classroom practice

learned through

Teacher planning and modelling referenced to SOLO Taxonomy and the Key Competencies

Including learning intentions, learning outcomes, learning experiences and formative and summative assessment



transforming learning outcomes

Contact

Pam Hook

pam (DOT) hook (AT) gmail (DOT) com

Julie Mills

jack-mills (AT) xtra (DOT) co (DOT) nz