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.

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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.

“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.”

Underestimate ability
Underrate importance of effort
Overrate how much help they need
Adopt low standards

.. 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.’”
What happens when students reframe learning into:

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

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.

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

“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.
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

[Diagram of HOT Maps and SOLO Taxonomy]

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

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

Prof David Jesson York University.

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
## School Curricula Effects for Gifted Students

<table>
<thead>
<tr>
<th>Influence</th>
<th>Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceleration</td>
<td>d=0.88</td>
</tr>
<tr>
<td>Enrichment</td>
<td>d=0.39</td>
</tr>
<tr>
<td>Ability Grouping</td>
<td>d=0.30</td>
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</tbody>
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Prof John Hattie Visible Learning 2009
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School curricula effects for gifted students

The school curricula effects discussed in this chapter relate to structuring different curricular experiences for gifted and talented students within schools, such as ability grouping and accelerated school programs. Gifted education programs for gifted students who are recommended for acceleration and accelerated school programs are often associated with higher achievement scores but lower levels of engagement and intrinsic interest. Therefore, it is important to consider individual students' needs and interests when designing curricular experiences for gifted students.

Feldhusen, and Asher (1991) found positive effects from various creativity programs, and thinking (d = 0.44).

Acceleration

An alternative to special classes for gifted children is to accelerate the curriculum. "Accelerated instruction enables bright students to work on learning tasks that match their abilities," Kulik and Kulik (1980) and by the effects of accelerated instruction on student achievement. Students in accelerated programs showed higher achievement scores compared to students in regular classroom settings. Students in gifted classes also showed higher achievement scores compared to students in regular classroom settings. However, students in gifted classes also showed higher achievement scores compared to students in regular classroom settings. However, students in gifted classes also showed higher achievement scores compared to students in regular classroom settings.

George, Cohn, and Stanley (1979) reviewed the evidence and concluded that there were no studies that showed results over accelerative methods, at best, enriching. The question is why there is so much resistance to accelerative methods. Usually perceived and irrational claims about social and academic benefits, or some timetabling barriers. Kulik and Kulik's students' attitudes towards schools seemed largely unaffected by instruction in accelerated programs—anything, there were positive social effects of acceleration and negative effects of not acceleration. There were no differences between methods of acceleration in which the higher effect size was 0.13, or if there was 0.21 (Kent, 1992).

Hattie (2009) suggested that the power of teaching was the most important variable in the success of gifted students. Hattie's model of student learning, which is Accelerated Learning, explains how the success of gifted students can be explained by the interaction of the environment and the student. The environment provides the necessary conditions for learning, while the student's ability to learn and the quality of instruction determine the outcome.

Enrichment

Enrichment involves activities that challenge and develop the student's intellectual abilities. Enrichment programs are designed to provide students with opportunities to explore new ideas and concepts, to think creatively, and to express their ideas in novel ways. Although the overall effect size for enrichment was small (d = 0.23), programs in which enrichment was part of the regular curriculum had positive effects on student achievement. Enrichment programs in which enrichment was part of the regular curriculum had positive effects on student achievement.
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.
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