SOLO Taxonomy and Assessing Learning to Learn

Pam Hook
www.pamhook.com

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SOLO Taxonomy - Biggs and Collis 1982
The Structure of Observed Learning Outcomes

Learning to learn

The curriculum encourages all students to reflect on their own learning processes and to learn how to learn.
Baseline Audit:

“Before we started learning to learn …”
Baseline Audit:

“What is learning?”

Survey your teachers and students to find out what they think or understand by "learning".
For example collect written, visual or verbal responses to the following questions.

*What is learning?*
*How do you know you are doing it?*
*How can you tell if it is going well?*
*How do you know what to do next?*
Why do we suggest this?

The baseline data will be useful to show any change in students’ “learning to learn” ability after you introduce learning interventions that target different intended learning outcomes.
Why do we suggest this?

The baseline data will be useful to show any change in students’ “learning to learn” ability after you introduce learning interventions that target different intended learning outcomes.

**Learning interventions:** For example, HOT Maps and rubrics, thinking skills and strategies and ICTs that help students achieve different learning outcomes.

**Intended learning outcomes:** For example SOLO Taxonomy –unistructural, multistructural, relational, extended abstract learning outcomes.
Develop questions for a “Learning to learn” survey
Develop questions for a “Learning to learn” survey

Questions to find out

**What** learning interventions are used.

**When or where** they are used.
How often the intervention/s are used. [Fluency]
How consistently the intervention/s are used. [Consistency]
In what context/s the interventions/s are used. [Flexibility]

**Why** the learning intervention/s were used. [Intended learning outcome]
Explore the structure of the assessment questions in the Zimmerman Martinez Pons research paper.


An example of questions you might develop after reading Zimmerman and Martinez Pons are seen in the HOT Metacognitive Tools Survey.
Create a thinking skills/strategies for “Learning to learn” SOLO self-assessment rubric.
SOLO PRESTRUCTURAL:
Learning outcomes for comparison show unconnected information, no organisation.

“E.g. “I can use [X] thinking skills/strategy if I have help or direction” .”
SOLO PRESTRUCTURAL:
Learning outcomes for comparison show unconnected information, no organisation.

“I need help to use [insert thinking skill/strategy].”
SOLO PRESTRUCTURAL:  
Learning outcomes for comparison show unconnected information, no organisation.

Student Exemplar:  I need help to use de Bono’s PMI strategy. What does the P stand for?
Where to next:

For student with pre-structural learning outcomes.
SOLO UNISTRUCTURAL:
Learning outcomes for comparison show simple connections but importance not noted.

“I can have a tilt at using [X] thinking skill/strategy”
I can identify a minus feature when using the PMI thinking strategy.
SOLO UNISTRUCTURAL:
Learning outcomes for comparison show simple connections but importance not noted.

Student exemplar: A negative feature of compulsory schooling is that it can feel like learning is something being done to you.
Where to next:

For students with unistructural learning outcomes.
SOLO MULTISTRUCTURAL:
Learning outcomes for comparison show connections are made, but significance to overall meaning is missing.

“I use [X] thinking skill/strategy on a trial and error basis to get a learning outcome”
SOLO MULTISTRUCTURAL:
Learning outcomes for comparison show connections are made, but significance to overall meaning is missing.

I can identify a plus, a minus and an interesting feature using the PMI thinking strategy.
SOLO MULTISTRUCTURAL:
Learning outcomes for comparison show connections are made, but significance to overall meaning is missing.

Student exemplar:

<table>
<thead>
<tr>
<th>Plus</th>
<th>Minus</th>
<th>Interesting</th>
</tr>
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<tbody>
<tr>
<td>A <strong>positive feature</strong> of compulsory schooling is that it ensures all children can access learning from the same curriculum.</td>
<td>A <strong>negative feature</strong> of compulsory schooling is that it can feel like learning is something being done to you.</td>
<td>An <strong>interesting feature</strong> is how difficult it is to value the learning that happens outside of compulsory schooling.</td>
</tr>
</tbody>
</table>
Where to next:

For student with **multi-structural learning outcomes**.
SOLO RELATIONAL:
Learning outcomes for comparison show full connections made, and synthesis of parts to the overall meaning

“I plan to use [X] thinking skill/strategy because it will help get a [Y] learning outcome”
**SOLO RELATIONAL:**
Learning outcomes for comparison show full connections made, and synthesis of parts to the overall meaning

I plan to identify plus, minus and an interesting features using the PMI thinking strategy because this will be useful when I am trying to compare different outcomes from a common event.
SOLO RELATIONAL: Learning outcomes for comparison show full connections made, and synthesis of parts to the overall meaning

Student Exemplar: I have chosen to use a PMI to identify the plus, minus and interesting features of compulsory schooling today because it will help me think about the changing function of schools in an increasingly networked future world by identifying the features of compulsory schooling worth retaining and features worth changing.
SOLO EXTENDED ABSTRACT:
Learning outcomes for comparison go beyond subject and makes links to other concepts - generalises

“I just sense that using [X] thinking skill/strategy is best if I want to get a [Y] learning outcome because”
SOLO EXTENDED ABSTRACT:
Learning outcomes for comparison go beyond subject and makes links to other concepts - generalises

Student Exemplar: I needed to clarify my thinking about the changing function of schools in an increasingly networked future world. I didn’t really consciously think about using a PMI, it just seemed to be right for the job.
<table>
<thead>
<tr>
<th>Level</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>“I need help to use [insert thinking skill/strategy].”</td>
</tr>
<tr>
<td>ii</td>
<td>“I can have a tilt at using [X] thinking skill/strategy.”</td>
</tr>
<tr>
<td>iii</td>
<td>“I use [X] thinking skill/strategy on a trial and error basis to get a learning outcome.”</td>
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<td>“I just sense that using [X] thinking skill/strategy is best if I want to get a [Y] learning outcome because”</td>
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Criterion based SOLO self assessment rubric for using thinking skills and strategies
How reliable and/or valid is student self assessment of use of learning interventions?

Measuring the degree of correlation between student self assessment and peer/teacher assessment.
Create a SOLO self-assessment survey of teacher/student use of thinking skills for “Learning to learn”.

[Image of SOLO self-assessment survey]

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Create a SOLO self-assessment survey of use of thinking skills for “Learning to learn”.

Align the SOLO self assessment rubric discriminators with;

Swartz and Perkins’ tacit, aware, strategic and reflective discriminators, and

Gordon Training Institute’s unconscious incompetence, conscious incompetence, conscious competence and unconscious competence discriminators.
## Self-Assessment: Teacher and Student Use of Thinking Skills and Strategies

Learning Outcomes based on the Structure of Observed Learning Outcomes (SOLO Taxonomy Biggs and Collis 1982), Swartz and Perkins and Gordon Trai

<table>
<thead>
<tr>
<th>Biggs and Collis 1982</th>
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<tbody>
<tr>
<td></td>
<td>Prestructural</td>
<td>Multistructural</td>
<td>Multistructural</td>
<td>Extendedstructural</td>
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<td>Learning outcomes show unconnected information, no organisation.</td>
<td>Learning outcomes show simple connections but importance not noted.</td>
<td>Learning outcomes show full connections are made and synthesis of concepts is evident.</td>
<td>Learning outcomes go beyond subject and makes links to other concepts — generalises.</td>
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<td>E.g. “I can use [X] thinking skill/strategy if I have help or direction”</td>
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<th>Gordon Training Institute</th>
<th>Strategic</th>
<th>Reflective</th>
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<td>Tacit</td>
<td>unconscious incompetence or unconscious unskilled</td>
<td>conscious competence or conscious skilled</td>
<td>unconscious competence or unconscious skilled</td>
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### THINKING SKILL

[Tick the box that best indicates your level of understanding of the thinking skill or strategy listed]

- [Insert your own]
- de Bono Six Hats
- PMI
- Brainstorming
- See Think Wonder
- HOT Describe Map
- HOT Generalise Map
- Alphabet Key
- Think Pair Share

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Surveying the Use of Thinking Skills and Strategies

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Learning to Learn Programme Evaluation

For more survey and assessment tools check out the HookED Wiki on www.pamhook.com
Contact
Pam Hook
pam (DOT) hook (AT) gmail (DOT) com

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