SOLO Taxonomy, Learning Intentions, Effective Strategies, Success Criteria, Self Assessment.

Pam Hook
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SOLO Taxonomy - Biggs and Collis 1982

Structure of the Observed Learning Outcome

Prestructural    Unistructural    Multistructural    Relational    Extended abstract

Identify the Learning Intention (LI).

[verb] [content] [context]

Use SOLO and constructive alignment to design learning intention/s that describe what students are to learn to understand an Achievement Objective or Achievement Standard.
Identify the Learning Experiences (LE).

THINK ABOUT ... 

[engagement relevance authenticity]
[prior knowledge]
[effective strategies]
[success criteria]
[formative feedback]
[self reflection]
Identify the Learning Experiences (LE).

Think [engagement relevance authenticity]

Check learning experiences against measures of engagement, relevance and authenticity.

How can I make this learning experience more engaging? How can I make this learning experience more relevant? How can I make this learning experience more authentic?
Identify the Learning Experiences (LE).

Think [prior knowledge]

Check learning experiences against students’ prior knowledge.

How can I make the learning experience appropriately challenging? How can I make the learning build upon what the student already understands?
Identify the Learning Experiences (LE).

Think [effective strategies]

Identify effective strategies to match the learning experiences.
Identify Teaching and Learning Activities and Experiences (LE).

[engagement relevance authenticity]
[prior knowledge]
[effective strategies]
[success criteria]
[formative feedback]
[self reflection]
Identify Teaching and Learning Activities and Experiences (LE).

[engagement relevance authenticity]
[prior knowledge]
[effective strategies]
[success criteria]
[formative feedback]
[self reflection]
LI: **Define** the geosphere on the Planet Earth.
LI: **Define** Pythagoras’ Theorum in two and three dimensions.
LI: **Define** the rights of consumers in NZ society.
LI: **Define** artwork from a Maori cultural context.
LI: [describe] [content] [context]

LI: Describe the continental crust of the geosphere.
LI: Describe the gradient of a line making an angle of 40° with the x-axis.
LI: Describe consumption in early 20th century New Zealand.
LI: Describe the use of colour in an artwork by Robin Kahukiwa.
LI: **Sequence** the distribution of heat energy around Planet Earth
LI: **Sequence** the steps needed to rearrange a line equation to the form $y = mx + c$
LI: **Sequence** the steps in setting up a limited liability company
LI: **Sequence** the preparation of Harakeke for Raranga (weaving, textile and fibre arts).
LI: [classify] [content] [context]

LI: **Classify** convergent plate boundaries by the plates involved.
LI: **Classify** straight line equations \((ax + by + c = 0)\).
LI: **Classify** the way firms compete in the market
LI: **Classify** design features used when carving hei matua.
LI: Compare & contrast the geosphere and atmosphere on Planet Earth
LI: Compare & contrast a parallel line with a perpendicular line.
LI: Compare & contrast two strategies for profit maximisation.
LI: Compare & contrast examples of traditional and contemporary Tuhi Whakaniko (visual art practice).
We are learning to:

COMPARE & CONTRAST
[content] in [context]
Learning Intention:

[explain causes] [content] [context]
We are learning to:

EXPLAIN CAUSES [content] in [context]

LI: Explain how mountain ranges form when plates collide.
LI: Explain why two lines are parallel if $m_1 = m_2$
LI: Explain how quotas on NZ butter to overseas markets effect NZ butter production.
LI: Explain why the artwork “Makaro” by Gordon Walters was criticised.
Learning Intention:

[explain effects] [content] [context]
We are learning to:

EXPLAIN EFFECTS [content] in [context]

LI: Explain the effects of subduction on the Earth’s surface.
LI: Explain the effect of increasing the change in y on the gradient of a line.
LI: Explain the impact of an economic event on economic activity.
LI: Explain the influence of whakapapa on Maori cultural design in an identified artwork.
Learning Intention:

[analayse] [content] [context]
We are learning to:

**ANALYSE** [content] in [context]

LI: **Analyse** the evidence for continental drift theory.
LI: **Analyse** the point/gradient equation \( y - y_1 = m(x - x_1) \)
LI: **Analyse** the circular flow model in economics.
LI: **Analyse** the pictorial features of contemporary artworks from Maori cultural contexts.
Learning Intention:

[analogy] [content] [context]
We are learning to:

**ANALOGY [content] in [context]**

LI: **Make an ANALOGY** for the Earth systems – geosphere, atmosphere, and hydrosphere.
LI: **Make an ANALOGY** for a line segment.
LI: **Make an ANALOGY** for venture finance.
LI: **Make an ANALOGY** for Alvin Pankhurst’s work *Maybe Tomorrow*. 

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Learning Intention:

[predict] [content] [context]
We are learning to:

PREDICT [content] in [context]

LI: **Predict** how a human activity will impact on the geosphere.
LI: **Predict** triangle classification by angle (right/obtuse/acute) using the Pythagoras’ Theorum.
LI: **Predict** the likely effect of a proposed GST increase on markets.
LI: **Predict** a future art style for Maori facial tattoo (Moko).
Learning Intention:

[evaluate] [content] [context]
We are learning to:

**EVALUATE [content] in [context]**

LI: **Evaluate** the impact of human activities on the hydrosphere.
LI: **Evaluate** the advantages of being a sole trader over working in a partnership.
LI: **Evaluate** the influence of European compositional practices on Maori 19th Century art.

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Learning Intention:

[generalise] [content] [context]
We are learning to:
GENERALISE [content] in [context]

LI: Generalise about the Earth’s systems.
LI: Generalise about the design of motorway onramps and Pythagoras’ Theorum.
LI: Generalise about economic concept of interdependence.
LI: Generalise about themes of kaitiakitanga in contemporary artworks with a Maori cultural context.
HOT SOLO Compare and Contrast Map and Self Assessment rubrics

HOT Target Vocabulary:
Compare:
Also, as, as well as, both, In the same manner, in the same way, like, likewise, most important, same, similar, similarly, the same as, too, still, in comparison, at the same time

Contrast:
Although, but, differ, even though, however, in contrast, instead, nevertheless, on the contrary, on the other hand, unless, unlike, while, yet, conversely, nonetheless
SOLO PRESTRUCTURAL:
Learning outcomes for comparison show unconnected information, no organisation.

“I need help to compare X and Y.”
SOLO PRESTRUCTURAL:
Learning outcomes for comparison show unconnected information, no organisation.

I need help to compare cats and dogs.
SOLO PRESTRUCTURAL:
Learning outcomes for comparison show unconnected information, no organisation.

Student Exemplar: I saw a dog on the way to school.
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 identify one relevant similarity or difference between [ X and Y ] ...”
SOLO UNISTRUCTURAL:
Learning outcomes for comparison show simple connections but importance not noted.

I can identify one relevant similarity or difference between [cats and dogs].
SOLO UNISTRUCTURAL: Learning outcomes for comparison show simple connections but importance not noted.

**Student exemplar:** Cats and dogs are different. A cat purrs and meows and a dog barks and growls.
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 can identify several relevant similarities and differences between [X and Y]."

Listing similarities and differences
SOLO MULTISTRUCTURAL:
Learning outcomes for comparison show connections are made, but significance to overall meaning is missing.

“I can identify several relevant similarities and differences between [a cat and a dog].

Listing similarities and differences
SOLO MULTISTRUCTURAL:
Learning outcomes for comparison show connections are made, but significance to overall meaning is missing.

**Student Exemplar:** Cats and dogs are different. A cat purrs and meows and a dog barks and growls. You take dogs for a walk, but cats exercise themselves. However, both dogs and cats are kept as pets. Both have four legs and fur.

Listing similarities and differences
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 can identify several relevant similarities and differences between [X and Y] and can explain why they are similar and different.”

Explaining the significance of the similarities and differences – “these are similar because”.

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SOLO RELATIONAL:
Learning outcomes for comparison show full connections made, and synthesis of parts to the overall meaning

“I can identify several relevant similarities and differences between [a cat and a dog] and can explain why they are similar and different.”

Explaining the significance of the similarities and differences – “these are similar because”.
SOLO RELATIONAL: Learning outcomes for comparison show full connections made, and synthesis of parts to the overall meaning

**Student exemplar:** Cats and dogs are different. A cat purrs and meows and a dog barks and growls. They are different because they use different sounds to communicate. You take dogs for a walk, but cats exercise themselves they are different because dogs are not allowed to roam freely on the streets. However, both of them are kept as pets. They are similar because they are both tame animals. Both have four legs and fur. They are similar because they are both mammals.
SOLO EXTENDED ABSTRACT:
Learning outcomes for comparison go beyond subject and makes links to other concepts - generalises

I can identify several relevant similarities and differences between [X and Y], explain why they are similar and different AND make a generalisation.

(overall ... because)
I can identify several relevant similarities and differences between [cats and dogs], explain the similarities and differences AND make a generalisation.
SOLO EXTENDED ABSTRACT:
Learning outcomes go beyond subject and makes links to other concepts - generalises

Student exemplar: Cats and dogs are different. A cat purrs and meows and a dog barks and growls. They are different because they use different sounds to communicate. You take dogs for a walk, but cats exercise themselves they are different because dogs are not allowed to roam freely on the streets. However, both of them are kept as pets. They are similar because they are both tame animals. Both have four legs and fur. They are similar because they are both mammals. Overall I think cats and dogs are more similar than different. This is probably because they are both domesticated and have lived alongside human beings for a long time.
Using SOLO Taxonomy Criterion Based Rubrics for Assessing Students Comparative Thinking

HOT Target Vocabulary:

Compare:
Also, as, as well as, both, In the same manner, in the same way, like, likewise, most important, same, similar, similarly, the same as, too, still, in comparison, at the same time

Contrast:
Although, but, differ, even though, however, in contrast, instead, nevertheless, on the contrary, on the other hand, unless, unlike, while, yet, conversely, nonetheless
<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I need help to compare $X$ and $Y$.</td>
</tr>
<tr>
<td>2</td>
<td>I can identify several relevant similarities and differences between $[X$ and $Y]$, explain why they are similar and different <strong>AND</strong> make a generalisation.</td>
</tr>
<tr>
<td>3</td>
<td>I can identify several relevant similarities and differences between $[X$ and $Y]$ <strong>and</strong> can explain why they are similar and different.</td>
</tr>
</tbody>
</table>
| 4     | I can identify several relevant similarities **and** differences between $[X$ and $Y]$.

- I need help to compare $X$ and $Y$. |
How reliable and/or valid is student self assessment of thinking?

Measuring the degree of correlation between student self assessment and peer/teacher assessment.
Where to next? – Using SOLO Taxonomy to build criterion based self assessment rubrics for student thinking for different thinking strategies.
E.g., definition, description, sequencing, classification, causal explanation, analysis, prediction, generalisation and evaluation.
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