Overcoming Zombie Content and Emotional Resistance to Learning

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But this nameless creature stared at me until I felt the blood freezing in my veins...

Got to--get out of here... its eyes... are blinding... feel myself... growing... numb...
Teaching Methods
Biology—polymorphism

Students’ memorize facts

- Libytheinae
- Danainae
  - Satyrine clade
  - Heliconiine clade
  - Nymphaline clade

Biologist generates hypotheses

but why?
Emotional Bottlenecks

What happens when students react to course concepts with emotions:

• Worldview (religion, identity, family)
• Resist disciplinary procedures

Example from geology:
What does this chapter tell about the age of the earth?
How old is the earth?

Student: —created 6,000 years  
Geologists—4.6 billion yrs
To make a conceptual shift:
1. Find out what students think about the topic before you teach it.
2. Show them their results.
3. Make a side-by-side comparison with disciplinary way of thinking.
4. Now they may begin to assimilate new instruction.
How old is the earth?

Student: —created 6,000 years

Geologists—4.6 billion yrs
The Decoding Cycle: Step One (The Bottleneck)

1. What is a bottleneck to learning in this class, a place where many students consistently fail to master crucial material?

2. What do specialists do so they get past this bottleneck?

3. How can I explicitly model these operations for students?

4. How can I give my students an opportunity to practice and get feedback on each of these operations?

5. How can I motivate students and address the affective side of learning?

6. How can I tell whether students have mastered these operations by the end of the process?

7. How can I share what I have learned with others?
Step 1: Bottleneck

- Geology: Students cannot apply the timescale to earth’s processes
The Decoding Cycle: Step Two (Expert moves)

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Step 2: Expert Mental Process
How old is the earth?

Student: —created 6,000 years

Geologists—4.6 billion yrs
What does Mexican immigration look like?

Students view

Historian’s metaphor
Graph of ocean temperature and depth
What is water?

Students’ view

Polar Scientist’s idea of Water
Step 1: Bottleneck

What is a bottleneck in a course you teach?

How does it manifest itself in student’s work? Students are unable to...

- First member of group speaks (3 mins)
- Second member of group speaks (3 mins)
- Third member of group speaks (3 mins)
The Decoding Cycle: Step Two (Expert moves)

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Step 2: Novices Interviews Experts

See Step 2 video.

Listen for the questions.
Step 2: Novices Interview Experts

1. Ask the expert about a specific example where they performed the task lately.
2. Ask, “What did YOU do?”
3. Imagine yourself doing what they describe. Summarize what the expert says; restate it. Are crucial steps being left out?
4. Ask questions where you don’t understand; probe where the expert cannot explain.
5. Reassure the expert.
6. Gently interrupt if expert talks about how they learned it, how they teach their students or if they start to lecture.
Step 2: Novices Interview Experts

**Interview** (15 minutes)

Interview one member of your group.

- The non-experts will ask the expert questions about what s/he does so as to NOT get stuck in the bottleneck. “What do YOU DO?”

- Try NOT to let the expert...
  - lecture about their content.
  - talk about how they teach their students or how they learned it.
Step 2: Novices Interviews Experts

See Step 2 video.
Listen for the questions.
Step 2: Decoding Interviews

Summary

• What did you learn from your interviews?

Social Knowledge Theory

Charles S. Peirce
The Decoding Cycle: Step 6 (Assessment)

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7. How can I share what I have learned with others?
Hawaii

Where my friends think I live

Where my parents think I live

Where people from my hometown think I live

Where society thinks I live

Where I think I live

Where I actually live
Step 6 Assessment: Finding more about the bottlenecks. E.g., evolution?

Students’ view

Complicating Creationism

- Flat Earthers
- Geocentrists
- Young Earth Creationists
- Old Earth Creationists
- Gap Creationism
- Day Age Creationism
- Progressive Creationism
- Intelligent Design Creationism
- Evolutionary Creationists
- Theistic Evolutionists
- Materialist Evolutionists
Step 6: Assessing Preconceptions

Useful Questions
1. Besides hard work, what does it take to do well in this course?
2. What happened during X? (the Middle Ages?
3. What have you heard about X? (global warming, calculus)

Always add Part II: “Why do you say that?”
Step 6: How would you assess student preconceptions?

Discuss in teams of 3:

What question could you ask to uncover the narratives or preconceptions students bring to your class?

3 minutes per person
How would you assess student preconceptions?

Report back--
Will someone share an example?
Uncovers tacit knowledge

Identifies “stuck” place
Where students are still stuck

Shares what works (and doesn’t)

Evaluates student mastery

Encourages perseverance and addresses non-compliance

The “Decoding the Disciplines” Cycle

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7. How can I share what I have learned with others?

Provides practice applying procedural knowledge

 Clarifies procedural knowledge
Step 7 Sharing: What are your next steps?

How might you use Decoding the Disciplines?

Discuss in teams (3 minutes)

Report back
Word Journal CAT

1. Summarize today’s session in one word. Then in a few sentences explain why you chose that word.

2. What questions remain?
What is writing in history?

Students’ view

Historian’s view