

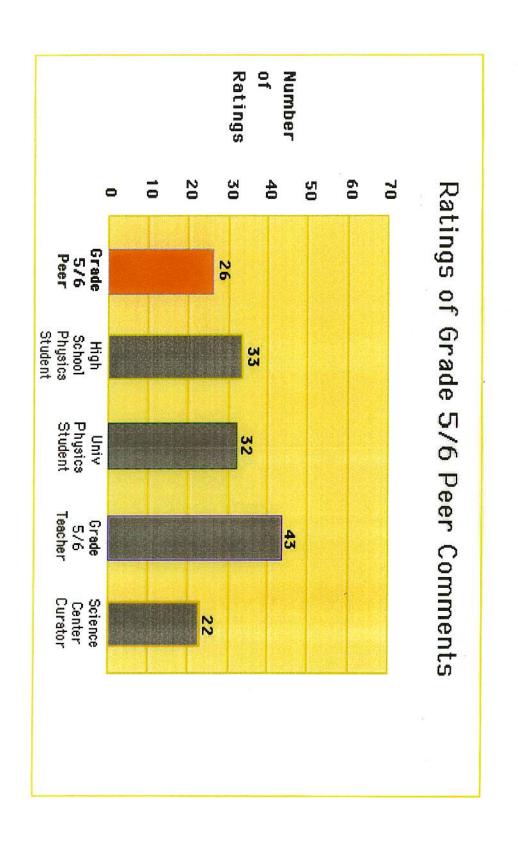
## Levels of Explanatory Inquiry (from Chan & Lee, 2001)

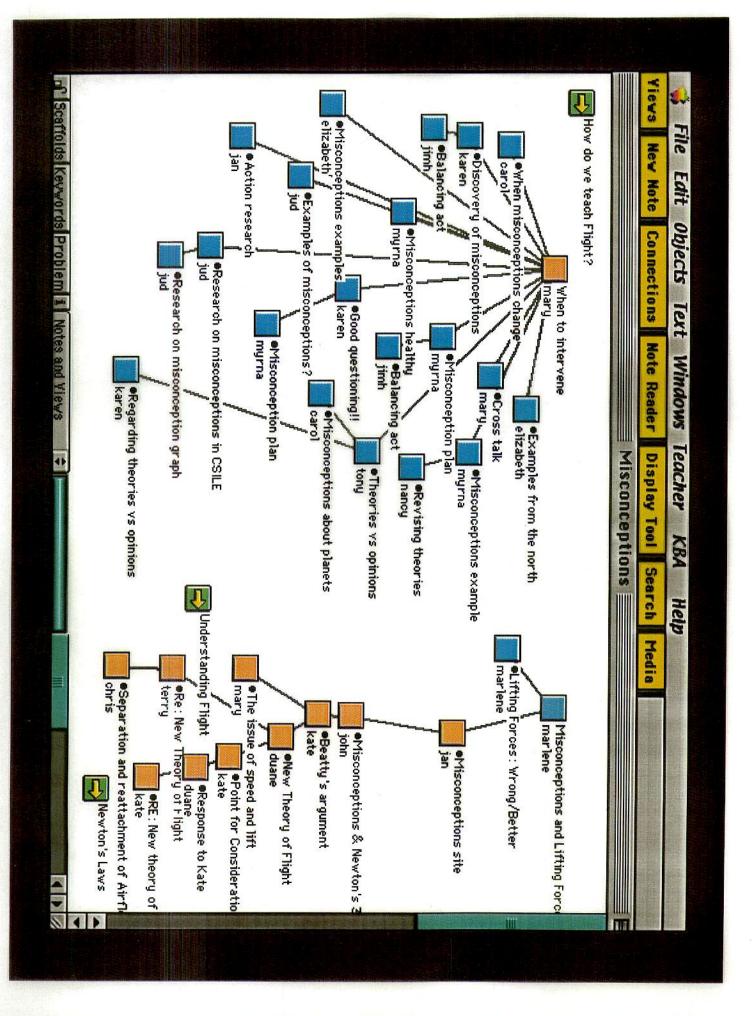
- Level 1. Questions asking about the definitions of terms.
- Level 2. Factual, topical, and general questions. Statements turned into questions by adding 'why' or 'how.'
- Level 3. Questions with conjectures.
- Level 4. Explanation-based questions.

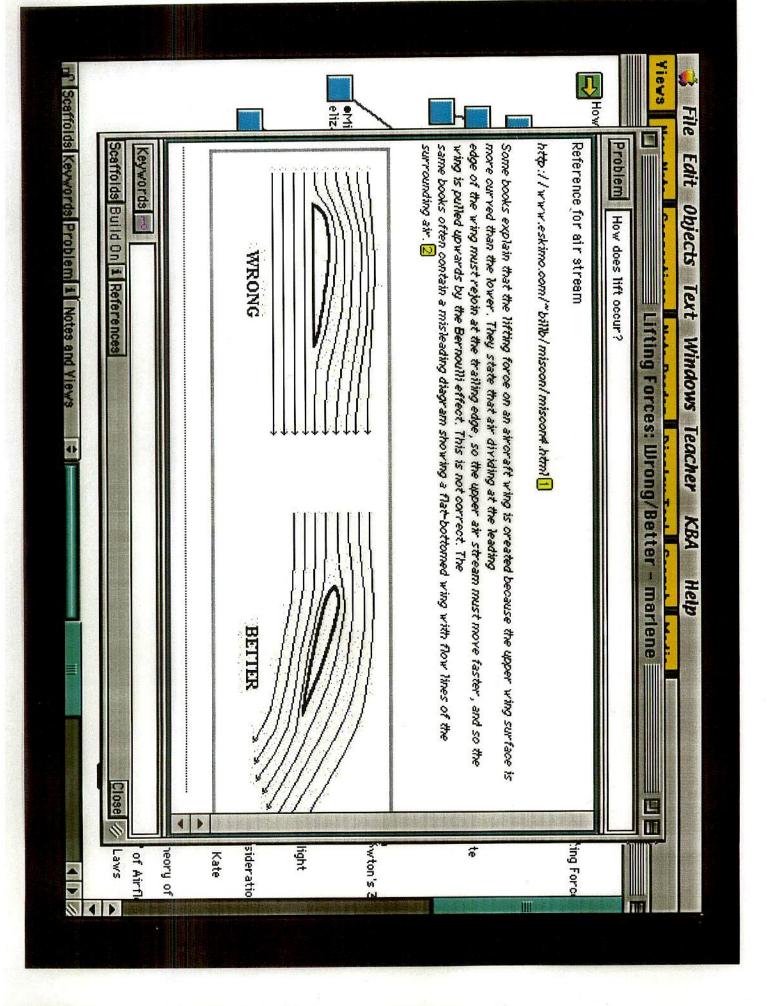
  Questions centred on problems that arise from an effort to produce explanations.

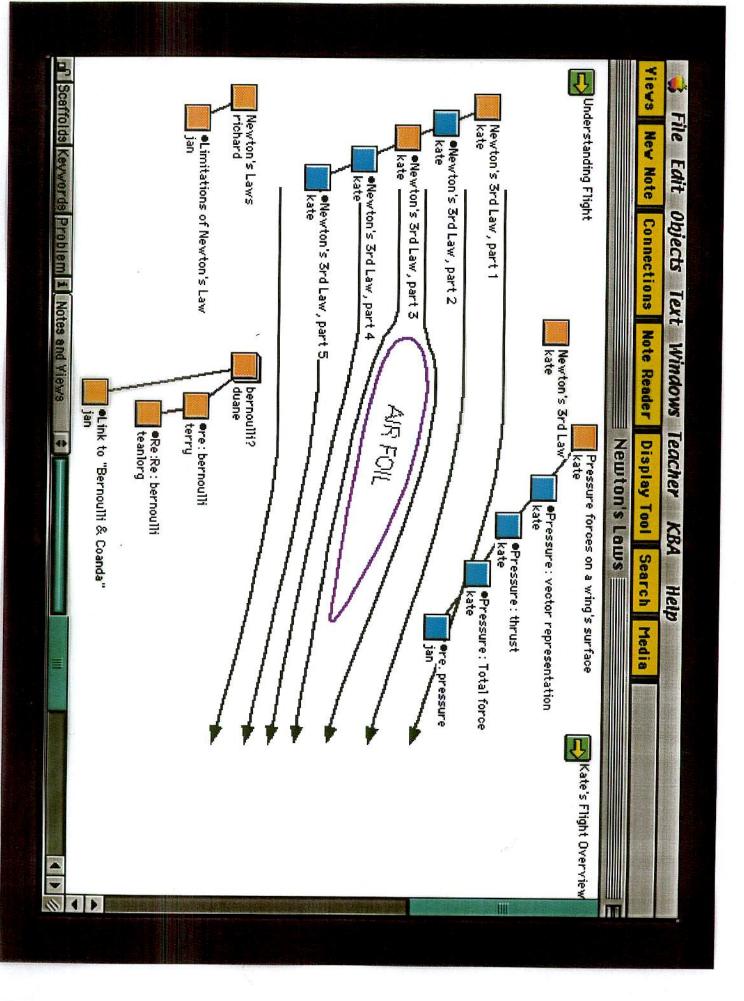
## **Example of Level 4 Question**

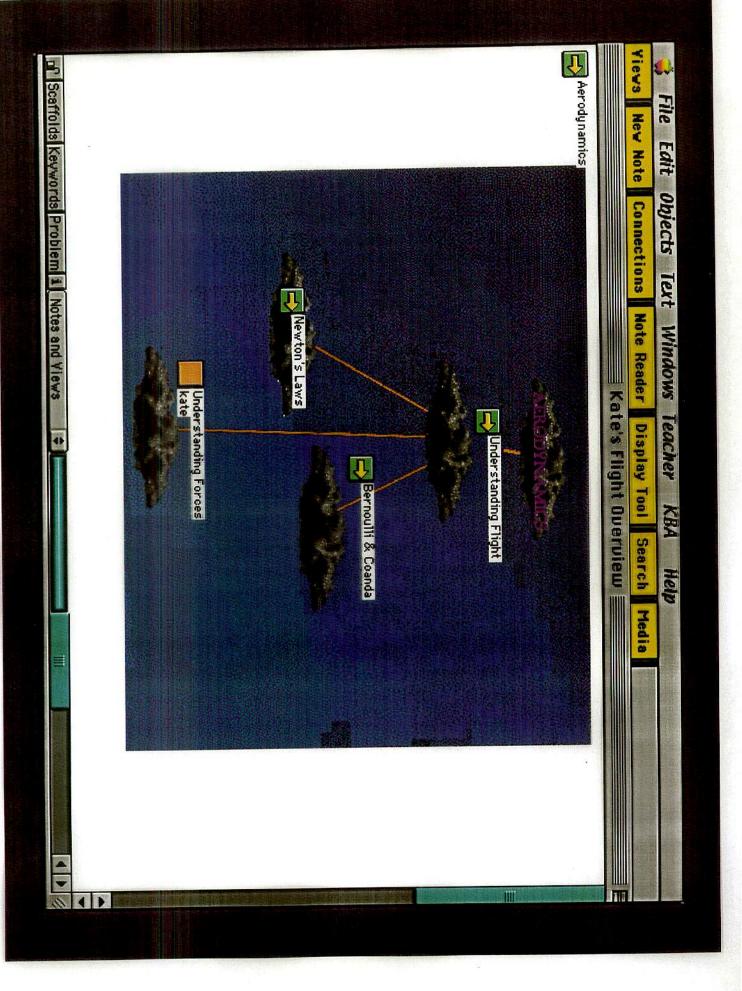
I don't understand why the plate located at the hot spot will tend to move apart. It seems there are no relationships between hot spot and the movement of plate. For example, Hawaii is located on the hot spot. Does it really split up? I think hot spots are related to the formation of volcano or volcanic arc or island. I would like some explanations on how hot spots are related to the movement of plates.

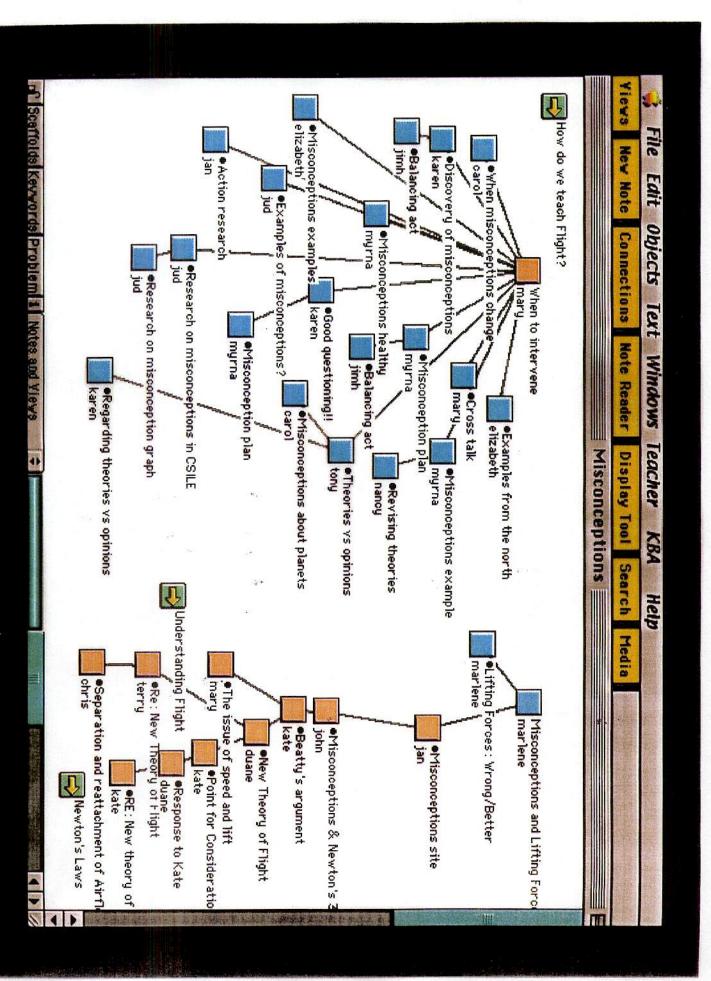


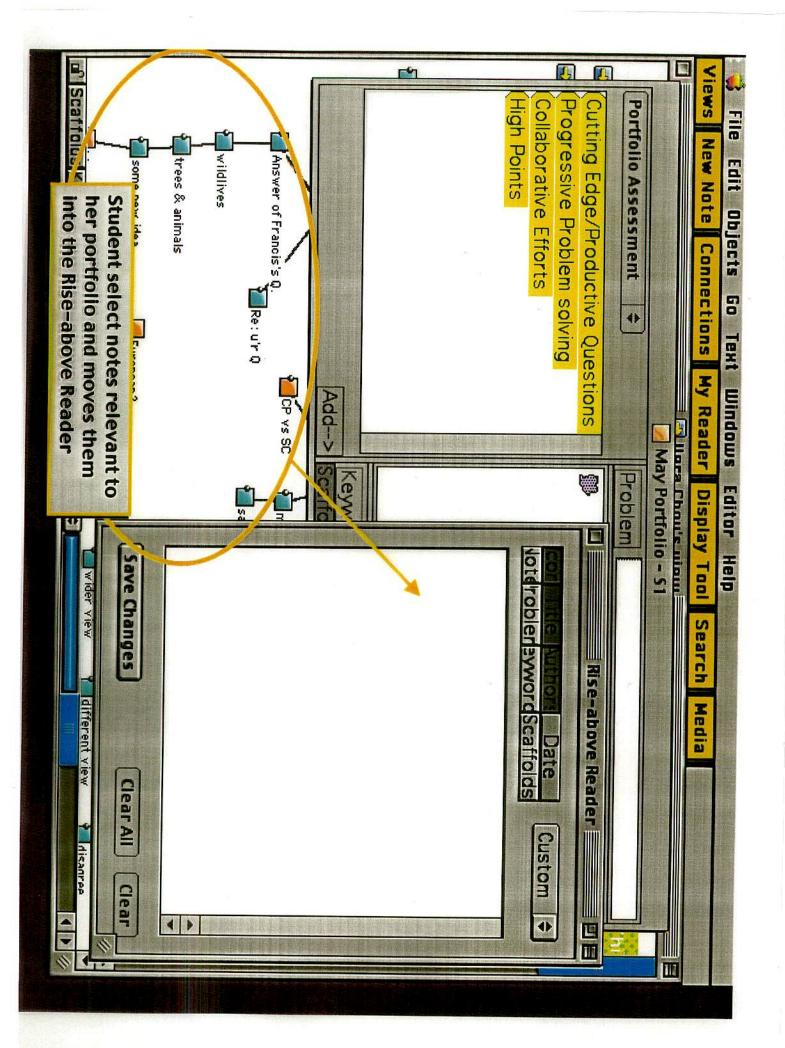


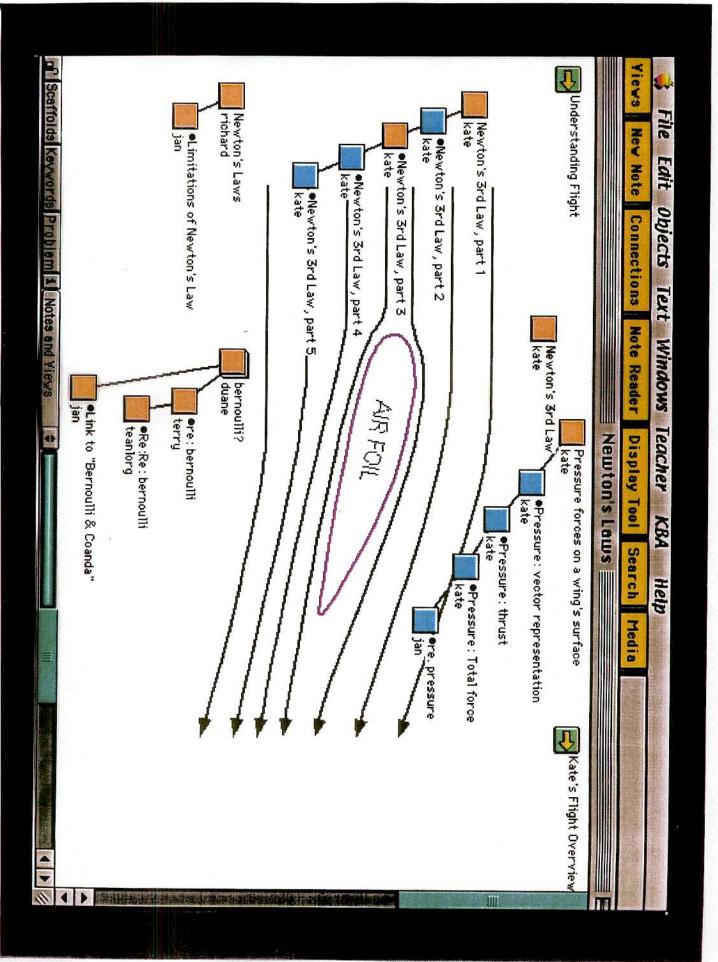


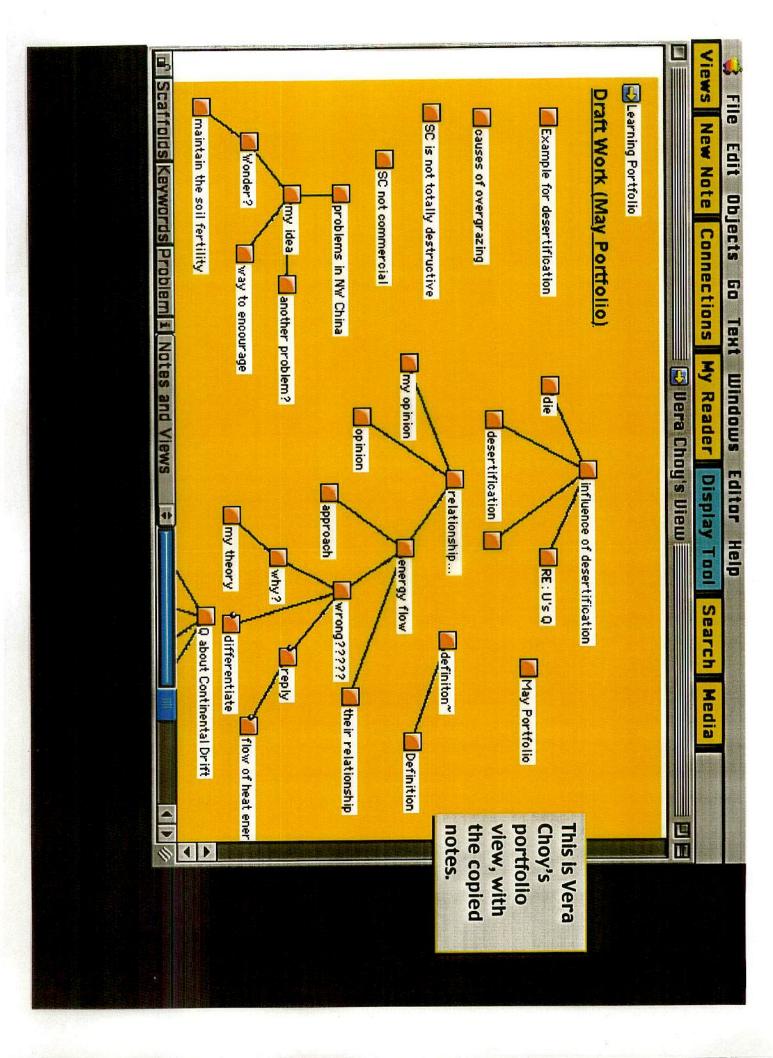


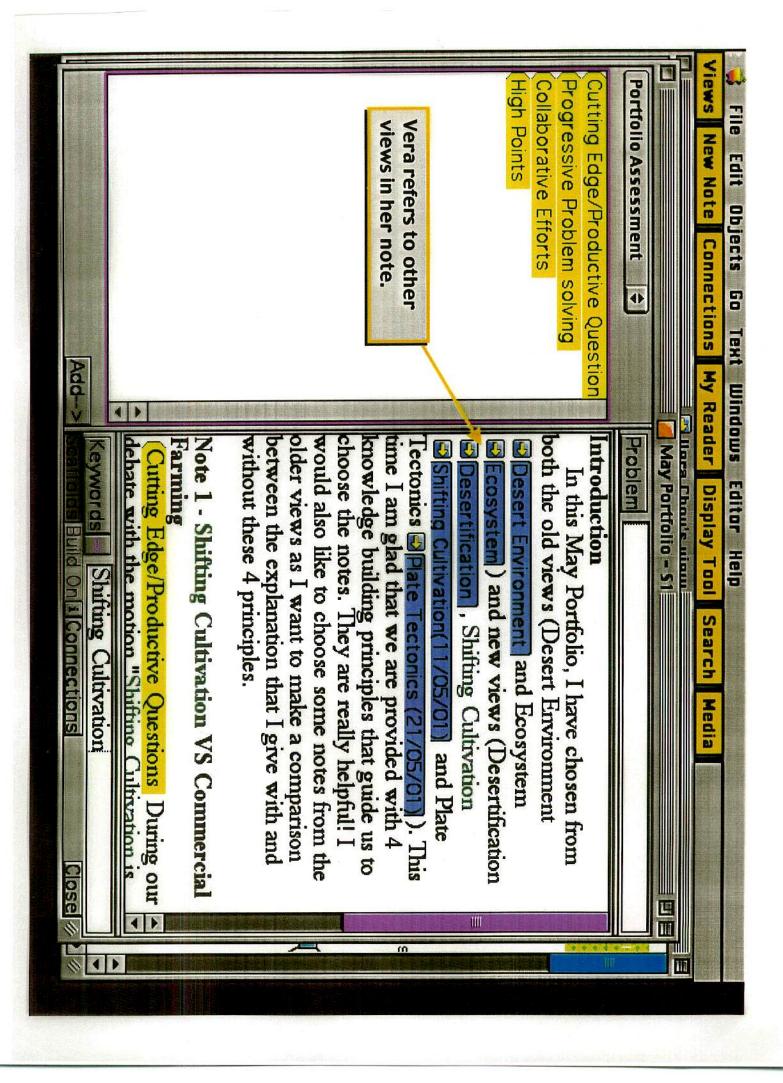


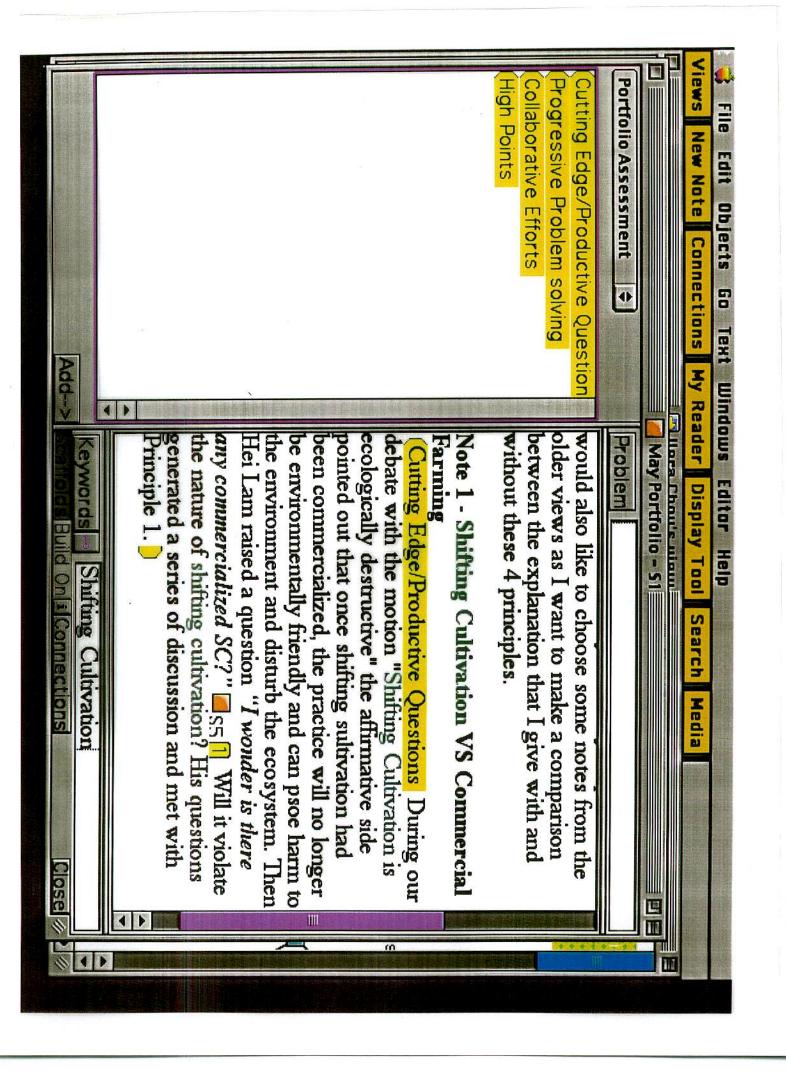


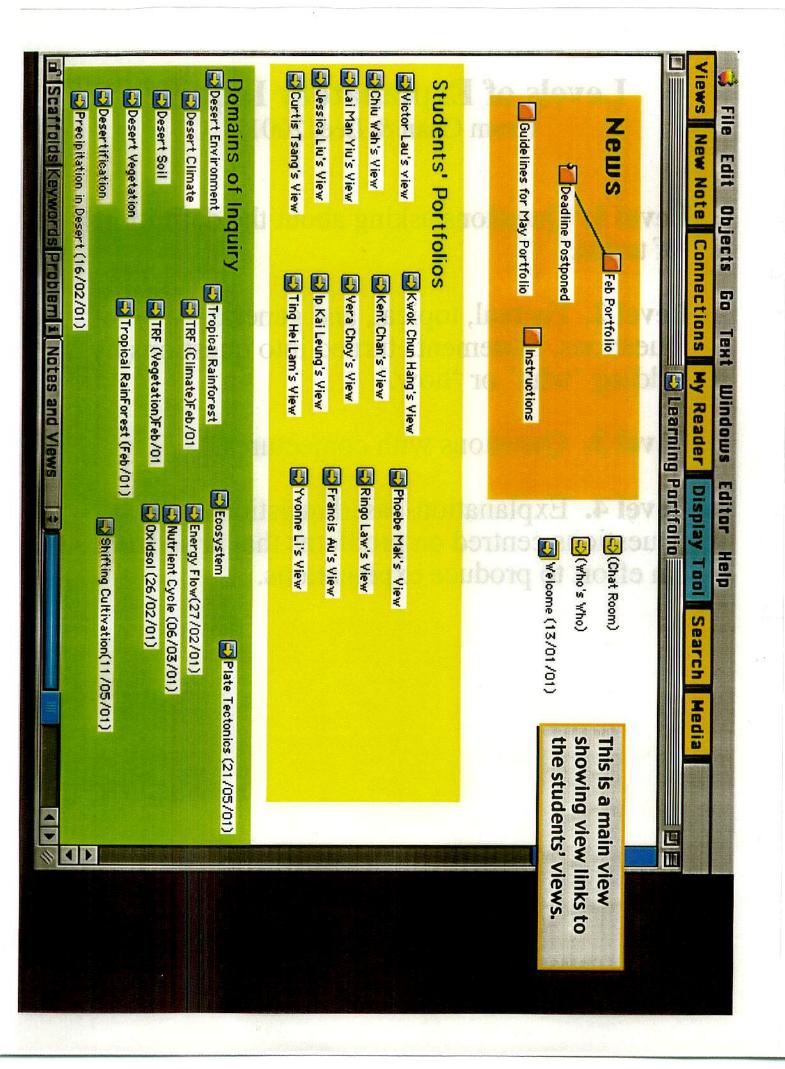












	ATK	KF Knowledge- Explanatory building	Knowledge- building
		Questions	Portfolios
Explanatory	*95.		
Questions			
Kb	*29	.74**	
Portfolios			
A-Level Essay & Writing	.29	.53(*)	.67*

\*P<.05; \*\*p<.01; (\*) p=.061

## Are the students covering the curriculum?

- 2 instructors asked to independently rank students based on demonstrated mastery of course readings
- "composite" note created for each student
- similarity matrix of LSA-derived cosines created for all student composite notes and course readings
- 1-D unfolding used to create scale
- rank correlations between instructors and LSA calculated
- instructor rankings and LSA rankings all intercorrelate beyond .90

## What are the students covering?

- database contributions from students and instructor in a Grade 5/6 class
- general topic of "Physical Science"
- Gravity, Buoyancy, Flight (Bernoulli's Principle)
- curriculum (textbook) materials: 66 paragraphs, grades 2 through university
- 136 student notes
- For each note: break into sentences;
- For each sentence: find top ten sentences from curriculum materials
- look up grade level (GL) for top ten sentences
- calculate mean and SD for GL
- overall mean grade level for "gravity" notes: 8.0 (SD=3.0)
- range: Grade 4 through Grade 10
- students covering topics that are most likely to be found in a Grade 8 textbook