

Adding Value to NSDL Resources through Pedagogical Content Knowledge Annotations

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What is Pedagogical Content Knowledge?

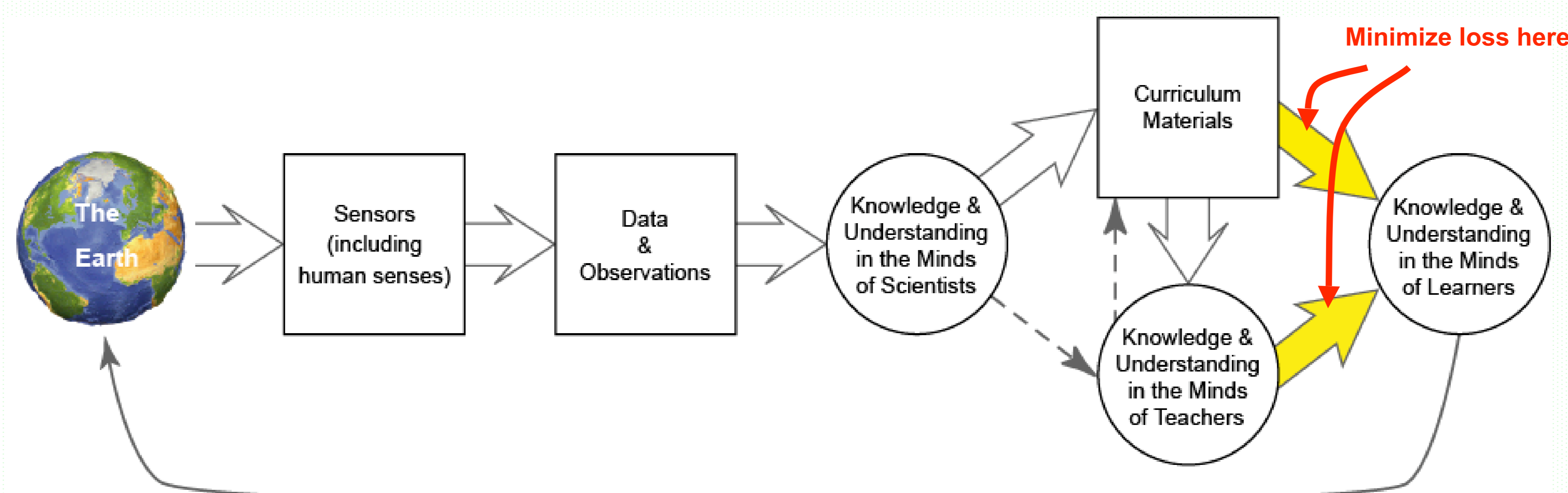
Pedagogical Content Knowledge (PCK) is knowledge needed to teach effectively in a discipline, as opposed to knowledge of the discipline itself (Shulman, 1986; Shulman, 1987; Hassard, 2005). It includes:

- what conceptions, including misconceptions, students are likely to have before instruction,
- typical difficulties students tend to have learning a given concept or topic,
- in what order to introduce concepts and skills so as to minimize confusion about a topic,
- what strategies work to help different kinds of students overcome common difficulties,
- how to choose and use instructional materials,
- what models/analogies/visualizations/activities work to convey specific understandings, and
- how to assess what students have learned about a given topic.

Pedagogical content knowledge is discipline- and topic-specific; there's not simply a set of general teaching strategies that a good teacher can use to teach anything (Bransford, et al, 2000).

Why is Pedagogical Content Knowledge Important?

Think of research and education as a system of information flows.



Information is lost and distorted at every step along the way. This project seeks to decrease loss and distortion in the arrow that feeds into "Knowledge & Understanding in the Minds of Learners" (from Kastens & Turrin, 2006).

What are annotations and how are they useful in digital libraries?

Annotations are "critical or explanatory notes or comment." (Arko, et al. 2006) In the digital library context, annotations can serve broadly to create new information resources, to interpret existing ones, to access resources in new ways, and to support the effective use of resources.

- Annotations can be used to capture, organize, and convey information that might otherwise be lost in the ephemera of emails or list servers, such as users' opinions about the usefulness of a resource or suggestions for adapting the resource for use in a classroom.
- Annotations can codify the professional judgment of third parties, who are neither resource creator nor library builder, for example, by marking resources that are judged to take an advocacy position on controversial issues.
- Annotations can flag resources that are of interest to a specialized subset of users, thus conveying specialized information that is only of interest to that sub-audience.

Click here to view earth system resource. →

Functional on test site

Click here to access annotations. →

Click to access PCK Skills resource

Click to access PCK Assessment resource

Click to access PCK Misconception Resource

Pedagogical Help

- Skills [Read](#)
- Assessments [Read](#)
- Misconceptions [Read](#)

Take home idea:
The value added in this project is not the Earth System resource nor the PCK resource, but rather the linkages shown in red.

How many resources have embedded PCK?

Question:

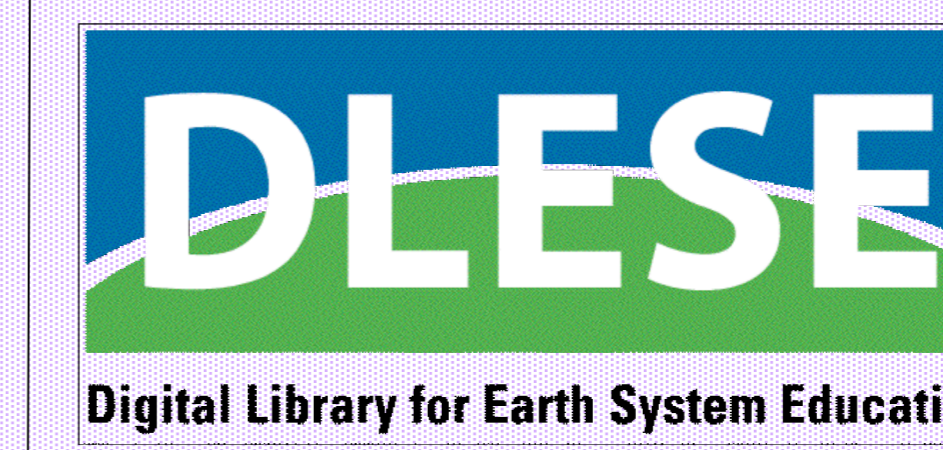
Wouldn't it be simpler and more effective to have self-contained teaching packages that include Pedagogical Content Knowledge embedded in the resource?

Answer:

We agree that designing teaching materials with PCK embedded is the ideal. But the reality is that the library already exists and the vast majority of NSDL resources include little or no embedded PCK.

Search Term	NSDL			DLESE		
	Skills	Assessment Strategies	Misconceptions	Skills	Assessment Strategies	Misconceptions
"radiation"	0	0	0	0	3	1
"convection"	0	0	0	0	3	2

The resources pointed to by the top 20 returns from each library's search engine (NSDL and DLESE) were examined. Numbers in table show how many (out of 20) of the resources showed Pedagogical Content Knowledge embedded within the resource.



www.dlese.org



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