Abstraction in Modeling through Synthesis (AiMS): Research on the Utility of Abstraction as a Guiding Principle for Learning about the Nature of Models

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Models are organized units of representations that abstract the structure of their referents (Capps & Shemwell, in press; Nersessian, 2008)

Teaching that models are abstractions:
- Helps students learn the true nature of models
- Defines what students should learn that models are
- Helps keep modeling authentic
- Brings structure to science narratives

Research on Learning:
- Does synthesis help students learn the abstract nature of models?
- Does model-based instruction help learners bring structure to the narrative?
- Knowledge of underlying structure of the domain
- Better comprehension
- Longer retention
- Transfer

Fidelity of Implementation
- Purpose: Increase sensitivity of quantitative study
- Measure adherence to defined key elements of instruction
- Correlate adherence with test scores within treatment group
- Check strength of association: adherence with condition differences

Research on Teaching:
- Purpose: Learn how teachers can develop the capacity to bring structure to science narratives
- Analyze data (e.g., interviews, video of PD, and enactment video) for
  - Degree to which prior instruction is driven by narrative
  - Desire for structuring the narrative
  - Receptiveness to structuring the narrative
  - Capability to structure the narrative; variations in structuring

Project Timeline:

https://coe.uga.edu/research/labs/aims-modeling-in-biology-project

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