Providing Preview

- **Situation**:
  - introducing a new topic
  - providing preview of content
- **Problem**:
  - use of technical terms to introduce new topic
  - preview of content based on technical terms, which are explained latter on
- **Solution**: Advance Organizers (AO):
  - introduce main ideas, essential concepts
  - connect with previous knowledge
  - Approaches: Start with commonly know analogy, use existing knowlege

Handling Abstraction

- **Situation**:
  - Abstraction/Concepts/Models play an important role in Computer Science
- **Problem**:
  - Difficult to comprehend abstractions/concepts/models
- **Solution**:
  - Materialization of abstraction: 3 ways:
    - 1. Enactive representation: experiencing, doing
      - semi-enactive: demonstration by teacher
      - virtual-enactive: Computer simulation
    - 2. Iconic representation: illustration, visualization
    - 3. Symbolic representation: text, symbols with semantics

Explaining the Invisible

- **Situation**:
  - Digital world consists of states and signals
- **Problem**:
  - Data streams, events, computation are typically not observable
  - Sequence of 0s and 1s provides no semantic
  - Digital devices are dynamic systems
- **Solution**:
  - Visualization of states
  - Simulation
  - Source: htttp://www.sigcse.org/topics

Transfering Knowledge

- **Situation**:
  - Students are taught elements/syntax/vocabulary
- **Problem**:
  - Students don't know how to apply these information
    - Information transfer. Not knowledge transfer
  - Trial & Error behavior of students -> ineffective
- **Solution**:
  - Analyze existing programs (program comprehension)
  - Analyze how things are used
    - Students gain knowledge from reading/analyzing