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# *Mutual Peer Tutoring*

**Presented by: Greg Sundgaard**

# Background

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- **Cognitive Psychology**

- **Intellectual Scaffolding: Lev Vygotsky**

- An individual's knowledge comprehension may be “scaffolded” or built upon prior knowledge to enable the learner to achieve higher order cognition.

# Background (cont'd)

## – **Prior Knowledge/Structural Knowledge:** **David Jonassen**

- **An individual's knowledge exists in two ways:**
  - 1. The “stuff” = **Prior Knowledge**
  - 2. The framework or structure around which that knowledge is built = **Structural Knowledge**

# Background

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- **ASK your Partner to Think ©**
- **(King, Staffieri and Adelgais, 1998)**
  - A model of tutorial interaction to scaffold peer learning.
  - This model emphasizes what the authors term “guided coinquiry” to scaffold the learning of tutoring partners.

# Discussion

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- **Verbal interaction that is content related is influential on learning in small groups**
- **Different types of interaction promote different kinds of learning**
  - **Example: Verbal Information**
    - **Can be accomplished through verbal interaction that consists of requesting and providing information.**

# Discussion

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- **Example: Knowledge construction (e.g. accommodative learning)**
  - This type of learning requires active construction through the analysis and integration of ideas.
  - The learner must go beyond simple factual learning toward a conception of how the new information relates to itself as well as to existing information.

# Discussion

- **Example: Knowledge construction (e.g. accommodative learning) cont'd**
  - **Verbal interaction to achieve this type of learning must be at a relatively high cognitive level.**
  - **Includes:**
    - Mutual exchange of ideas
    - Explanation
    - Justifications
    - Speculations
    - Inferences
    - Hypotheses
    - Conclusions

# Discussion

- **This type of learning is similar in kind to many constructivist environments.**
  - Shifts responsibility for learning away from teachers and onto students
  - Leads to increased feelings of personal responsibility, increased self-efficacy and increased self-regulation of learning strategies
- **The cognitive structures (structural knowledge) of the learners are modified as a result of these types of interactions.**

# Discussion

- **ASK your Partner to THink**

- Designed as a model for use by students of like ability and competence.
- Provides sufficient structure to support high level complex processing.
- Provides sufficient autonomy and flexibility for practical use by like ability peers.

# Discussion

- **ASK your Partner to THink**

- **Revolves around the use of a variety of questioning strategies to facilitate the joint construction of knowledge for the tutor and the tutee.**
- **“Guided Coinquiry”= mutual peer questioning**
  - **Different kinds of questions (to facilitate different types of learning).**
  - **Careful sequencing of those questions to aid in construction of new meaning.**

# Model

- **Tutoring “Dyad”**

- **Two students**

- **Tutor:**

- Constructs knowledge through generation of questions for partner.

- **Tutee**

- Constructs knowledge by generating explanations to tutor’s questions.

- **Students in this method are provided training in how to guide and scaffold learning and how to alternate roles.**

# Model

- **Types of questions**
  - Review
  - Thinking
  - Probing
  - Hinting

# Model

- **Types of questions**

- **Review**

- This type of question is designed to activate the tutee's prior knowledge and to assess the extent of that prior knowledge.

- Triggers definitions, descriptions, explanations, summaries etc.

- Helps solidify, clarify and integrate the tutee's knowledge base.

- **Example:**

- What does “realpolitik” mean?

# Model

- **Types of questions**

- **Review(cont'd)**

- **If the tutee's knowledge is not readily available, the tutor asks "probing" questions.**
    - **Example:**
      - I don't understand. What do you mean by that?
    - **If the tutee exhibits misconceptions or the knowledge base is incomplete, the tutor asks hinting questions to help lead the tutee to the answer.**
    - **Example:**
      - Have you thought about ...?

# Model

- **Types of questions**

- **Thinking**

- **Once the Review stage is complete, the students have each activated and integrated their shared knowledge of the topic.**
- **The tutor then goes on to ask “thinking” questions.**
- **Example:**
  - **What is the difference between a metaphor and a simile?**
- **This type of question requires the tutee to go beyond recall and toward integration of concepts.**

# Model

- **Types of questions**

- **Thinking (cont'd)**

- **The construction of questions at this stage builds the tutor's learning as well.**
      - Tutor must monitor their own understanding (a metacognitive process) to be able to ask probing and hinting questions of the tutee.
    - **The process of questioning, explaining and further questioning results in the mutual scaffolding of learning.**

# Model

- **Types of questions**

- **Thinking (cont'd)**

- **Additionally, the peer element of the dyad results in the development of situation-based knowledge representations, thus making them more personal to the students and therefore more durable.**

# Model

- **Types of questions**

- **Probing and Hinting**

- Probing and Hinting questions in this model are designed as supplements for the two principal questioning types, **review** and **thinking**.
    - **Probing**
      - Probing questions typically are designed to help a tutee expand on an incomplete answer.
      - Example:
        - Can you give me an example of what you mean?

# Model

- **Types of questions**

- **Probing and Hinting (cont'd)**

- **Hinting**

- Hinting questions are designed to help students make connections between concepts or to help solve problems.

- Example:

- Why is it important for instructional designers to be concerned with instructional strategies?

# Pros and Cons

## ● Pros

### – Very Efficient

- Both students can take advantage of the question types and sequence to help them scaffold their own knowledge.

### – Effective

- Research indicates the sequenced interactive questioning used in this strategy improves students learning, feelings of self-efficacy and metacognition.

# Pros and Cons

## ● Cons

### – Cost

- This strategy is a copyrighted program (\$\$\$).
- It requires a heavy investment in the front end via teacher intervention to get students “up to speed” on questioning techniques and sequencing.

### – Parity

- Students have to be very similar in their prior knowledge.
- Students have to be very self-aware as to their knowledge base and confident in that knowledge.

# Design Implications

- **Systematic**

- This strategy provides for a systematic framework of question generation and sequencing.

- **Theory Base**

- As a model for instructional design, it provides a solid theoretical foundation in cognitive psychology for the mutual scaffolding of learning among peers.
  - Vygotsky
  - Cognitive Psychology

# Design Implications

- **Adaptive**

- Designers can adapt and modify the foundational ideas to their own work.

- **Assimilative**

- Most of the techniques are easily layered onto the existing cognitive foundation held by designers in the field.
  - Close association to SQ3R method
  - Close association to Case Study analysis techniques