Applications of Conversation Theory for Learning: A Case Study

Meri Mohr
Purpose

- **Meri’s Goal:** To clarify my thinking and solidify my understanding of Conversation Theory and its application to technology designed for learning.

- **Meri’s Methods:**
  - Introduce Betty, a teachable agent
  - Show how CT and “The Media Equation” apply to using Betty for learning
You asked me: If fish increase, what happens to carbon dioxide?

I think that if fish increase, carbon dioxide increases a lot. These are the paths I followed to get my answer.

If you want me to explain my answer, click Explain. To see my notes, click Notes.
It-referenced Interactions between Student and Betty

A: Student

“Teach my Agent what I know about domain X.” Student creates nodes and connects them with relationships in the system.

B: Betty

Agent answers questions by locating nodes and relationships and generating an “answer.”

C: Q + A

Student asks Betty questions to “test” the model.

D: Display of answer

Agent returns results in text format to the Student.

E: Assessment

“Is Betty giving me back answers that make sense?”

F: Repeat as desired

F: Iterative Execution

KEY

A: Controlling Process
B: Controlled Process
C: Injunction to Execute
D: Return of Results of Execution
E: Comparator
F: Iterative Execution
The Media Equation
Nass & Reeves

Humans will treat media as fellow social actors
The Media Equation
Nass & Reeves

Humans will treat media as fellow social actors
Participative System Model

What if students interacted with Betty as if “she” were a 2nd Order system?
I-You Referenced Interactions
between Betty and Student

**BETTY**

A: “I need to be able to answer any question about the domain”

B: “I reason using all relevant relationships and nodes to generate an answer.”

G: *Statement of Goal*

J: *Animation of path taken to connect nodes indicated in question*

**STUDENT**

I: “Betty wants me to package up what I know into chunks, think about relationships step-by-step, and make visible my thinking so she can learn more effectively.”

H: “Betty wants to be able to answer any question about this domain.”

K: “Betty uses all of the information in the nodes and relationships to figure out the answer.”

L: “Betty answers every question by using the same method.”

**KEY**

G: Communication about Goal
H: Reproduction of other’s concept of goal
I: Inference of higher goal
J: Communication about Method
K: Reproduction of other’s concept of method
L: Check of consistency
### Betty Shows Initiative

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<th><strong>Tell Betty to take a quiz</strong></th>
<th><strong>Student has not asked Betty a question since last quiz</strong></th>
<th>“I still do not feel prepared to take a quiz. I don't understand enough about the causal relationships in the river. Please ask me some causal questions to see if I understand.”</th>
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<td>Betty’s answers have changed since last quiz</td>
<td>“What you have taught me has changed my thinking. I had some questions right on the quiz, but now I think I would answer them wrong.”</td>
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<td><strong>Add a link to Betty’s concept map</strong></td>
<td><strong>First causal link in the session</strong></td>
<td>“Hey! Let me see if I understand this.” (Betty reasons with link, and explains her reasoning)</td>
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<td><strong>First causal path with two or more links</strong></td>
<td>“OK. I think I know how this works.” (Betty reasons with path, and explains her reasoning)</td>
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## Initial Recommendations
Betty expresses the designers’ goals

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<td><strong>After Betty takes a quiz</strong></td>
<td>Betty wasn’t able to answer a given question</td>
<td>“I wasn’t prepared to answer the question about X. Can you show me how X relates to Y in the river system?”</td>
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<td>Betty answered a given question incorrectly</td>
<td>“I was confused on this question: &lt;question text&gt;. Do you think we can go over it again?” (Betty reasons with path, and explains her reasoning)</td>
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Insights

- Betty is a tool that uses conversation to help a student **design** his or her own **thinking** about a domain.
- Direct communication from Betty about “her” goal could increase the likelihood that students will form a useful model of the systems purpose.
- Framing Betty in terms of CT leads to insights about the interaction between student and agent that can positively impact learning outcomes.