BigBlueBot:
Teaching Strategies for Successful Human-Agent Interactions

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Our examinations of chatbot logs from Watson Assistant reveal that peoples’ expectations of what chatbots can understand and do far outpace their actual technical capabilities.

U: I need to know if I would qualify for full time employment. I am a 70 year old male, I am a retired marine, and I have bad knees.

A: Most entry level positions require no experience or minimal amounts of experience. Check out the information on our job description page.

U: I also suffer from insomnia and don’t sleep well at night. Is this a problem?

A: <HUMAN>

U: Good morning my name is Samuel and I applied for the baggage inspector position last month and I haven’t heard anything yet

A: I'm sorry, I don't know how to answer your question

* fictional examples adapted from real WCS data
BigBlueBot is an experience designed to teach three lessons about chatbots

1. Chatbots don’t understand complex, unnecessary context and it’s best to talk to them using simple language

2. Breakdowns occur when an utterance matches the wrong intent or doesn’t match an intent at all

3. Chatbots can recover from breakdowns using several strategies

The experience has two conversations
Players take the role of a chatbot to help a customer

“Fake” language is used to simulate misunderstanding

Fixed responses at each conversational turn

Each response maps to a strategy for understanding the initial query

• Take a guess at the right answer
• Disambiguate context by defining a word
• Ask user to simplify their question
Educational Summary: Conversational Strategies

Post-conversation summary screen shows players the strategies they took in the conversation and explain why they worked (or didn’t)

- Take a guess at the right answer — 🤖
- Disambiguate context by defining a word — 🤨
- Ask user to simplify their question — 😐

Opportunity to teach broader lessons about interacting with conversational agents, based on their actual interactions

Nikita used a word you didn’t understand, “perieve,” and you asked her to define it for you. We call this strategy disambiguating context. It turned out that “perreve” meant “wallet,” but was this an important detail to learn to help Nikita with her question?

Here you took a guess about what Nikita was asking and tried to provide her with an answer. Sometimes, when a chatbot doesn’t have a high confidence in what you are asking, it may take a guess and try to answer your question anyway! In this case, your guess didn’t help answer Nikita’s question.

You asked Nikita to define another word and you learned it meant “cash.” Even though you got a better sense of the background details in Nikita’s story, were they helpful in understanding Nikita’s complicated question?

If you have interacted with a chatbot before, you may have seen this strategy where a chatbot asks you to rephrase your question when it doesn’t understand. In this case...
Conversation 2 – Shopping

Players take the role of a customer interacting with a shopping chatbot

Three tasks to accomplish

• Check if an item is in stock
• See if a coupon code is still valid
• Track a shipment

Conversation implemented using Watson Assistant

• Fixed-response options force conversational breakdowns
• Free-text responses impart realism
Educational Summary: Conversational Breakdowns

Breakdowns triggered by utterances that either hit the wrong intent or don’t hit any intent

Bot uses a variety of strategies to recover

- Ask a clarifying question
- Show options
- Ask to rephrase
- Defer to a human agent
Evaluation

Ran Mechanical Turk study (N=88 participants)

Participants experienced both conversations (randomized order) and filled out surveys before, during, and after

Survey measures included
- Prior experience with chatbots
- Learning outcomes
- Feelings toward the chatbots (empathy, helpful)
- Enjoyment

Research questions

RQ1. What lessons do people learn from the experience?

RQ2. How did the experience make people feel toward chatbots? Did they desire to interact with them afterward?
RQ1: What lessons do people learn from the experience?

“I need to try to get to my point better. The bot can have a hard time trying to understand.” (P66)

“I need to be clear and concise with my questions, making sure to give enough detail, but not too much.” (P49)

“I learned when talking to a bot I need to use more precise wording. It's best to express intent first and then follow up with the details.” (P23)

“I learn that I must make my intent clear or else the bot will fail to understand me.” (P83)
RQ2. How did the experience make people feel toward chatbots? Did they desire to interact with them afterward?

“I really enjoy using chatbots. I think they can simplify a lot of customer service issues. It really speeds up customer care in a lot of cases.” (P36)

“While I wouldn’t be opposed to interacting with a chatbot, I’d probably not choose it as the first thing to interact with.” (P1)

“They can be helpful if they are given the right info. I will work with them in the future willingly.” (P18)

“The chatbot is good for simple questions that are easy to answer, but I feel like communication breaks down too easy when the requester becomes too complex. I still prefer a human.” (P83)
Thank you!