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The World's Largest Modeling, Simulation & Training Conference



## Next Generation Learner Interactions with Personal Assistants for Learning

**Elaine M. Raybourn, Ph.D.**

**Sandia National Laboratories**

**Jeff Mills, Kent Weeks**

**Katmai & Tolliver Group**

**Advanced Distributed Learning Initiative**



**Sandia  
National  
Laboratories**



# Our Next Generation Learner Team

Elaine Raybourn, Ph.D., Principal Investigator, UX and Transmedia Learning Design

Peter Berking, Instructional Design

Paige Bohan, Study Coordinator

Jeffrey Mills, 3D Virtual World Development

Steven Vergenz, Programming & Software Development

Kent Weeks, Scenario Design

Alan Workman, Software Engineering & Development

Hunter Slosser and Matthew Munoz, Next Generation Learners



Avatar courtesy of LivingActor.com

# Presentation outline

- ▶ What motivates our research?
- ▶ What is the Imaginarium?
- ▶ Virtual environment design and functionality
- ▶ Imaginarium scenario
- ▶ Research study
- ▶ Next steps
- ▶ Conclusion

**WHAT MOTIVATES OUR  
RESEARCH?**

**WHAT IS THE  
IMAGINARIUM?**

# Motivation and research

## Learning Environment

- Novel, multimodal human-system interactions
- Data sharing across applications
- Knowledge representation
- Machine understanding- driven search and retrieval
- Expert models



## Learner

- Foster conceptual mastery and cognitive agility by combining...
  - Sound assessment methodologies
  - Learner modeling
  - Pedagogical modeling
  - Sound instructional design principles
  - Interactions with live and artificially intelligent peers and mentors

**Unobtrusive Intelligent Ubiquitous**

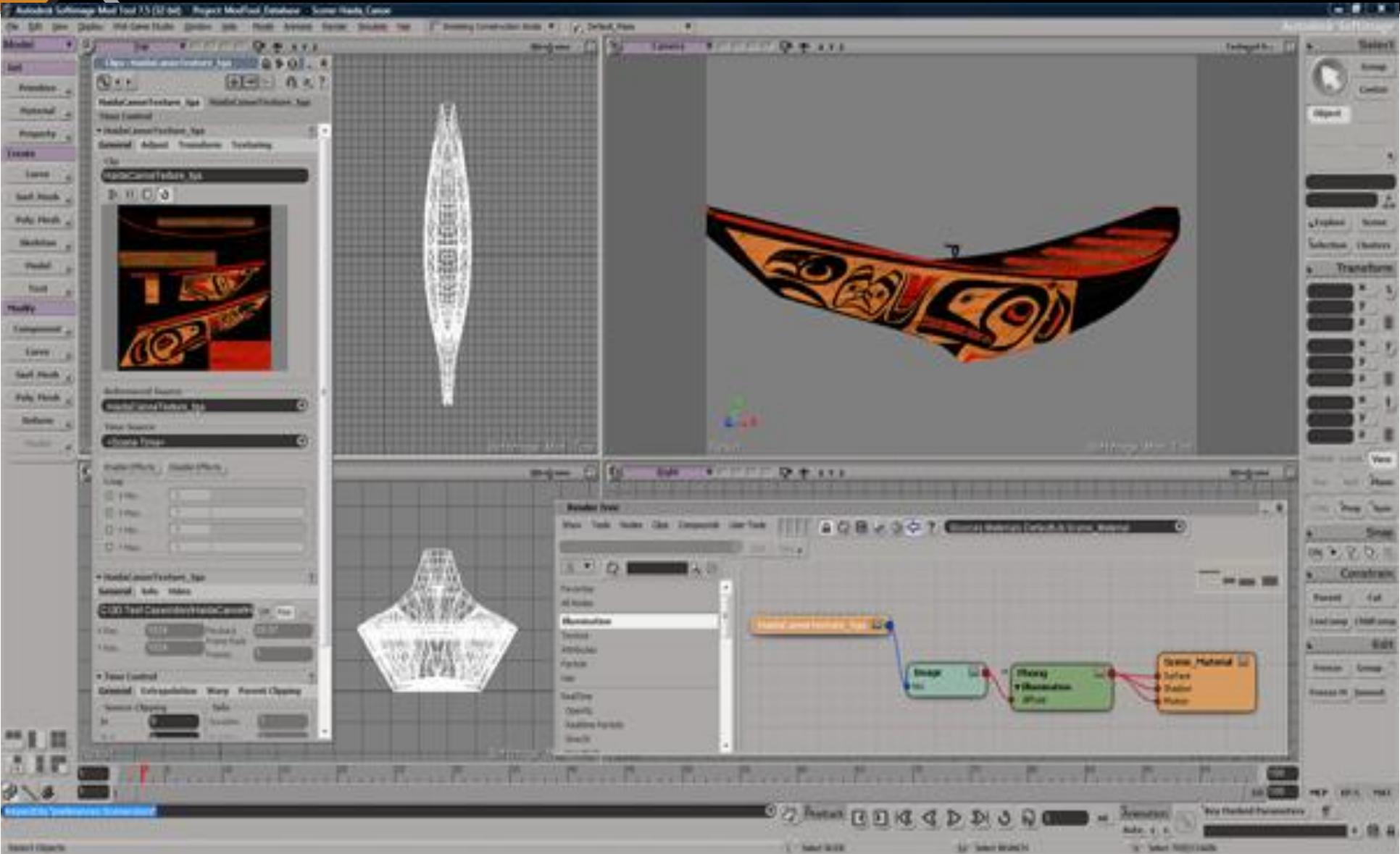
# Anthropology of Future PAL



- Invisible interface = immersion
- Seamless interaction
- Guard against loss of humanity
- Guard against regression

# VIRTUAL ENVIRONMENT DESIGN AND FUNCTIONALITY

# 3D Modeling



# Functionality

The screenshot displays a virtual world interface. The main window shows a character in a forest setting, standing near a table with two large salmon, a plate of food, and a decorative vase. A "Leader Board" icon is visible in the top right corner of the main window. The sidebar on the right contains the following content:

- Imaginarium Notes**
- Pacific Salmon**
- Characteristics**

The salmon is among the most revered of coastal animals, for its cultural and spiritual importance to First Nations, its world-famous tasty flesh, and its role in the economy of British Columbia. The most common salmon in our local waters are Chum and Coho.

All Pacific salmon species spend most of their life in the ocean but migrate to fresh water to breed. They therefore interact with several different ecosystems, and play important roles in freshwater and marine food webs.
- What is it:**

Enter type of species (e.g., a beetle, a snake, a plant, etc.)
- Why this species:**

Reason for choosing this species
- Enter Your Role:**

Save Your Notes

A text box at the bottom left of the main window reads: "PAL: Salmon is a key part of the Haida diet, like the animals here."

# IMAGINARIUM SCENARIO

# Research Rangers



# Use your PAL to problem-solve



# Can you help?



identify what the problem is



# Identify why there is a problem and how to address it

**Imaginarium Virtual Camp**  
Home Habitat Facts



### Mountain Pine Beetle

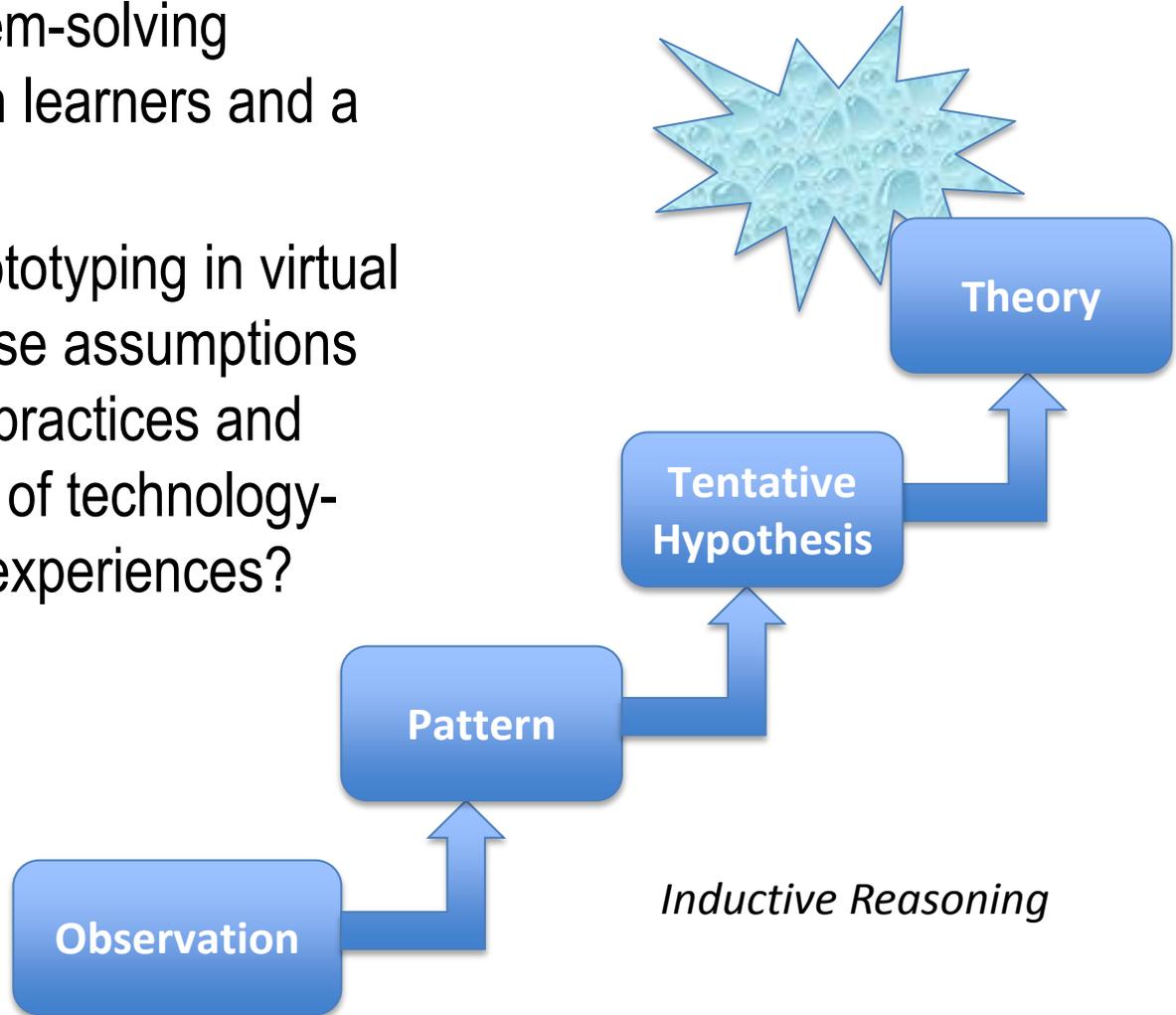
**Characteristics**  
The Mountain Pine Beetle is a native species of insect that is known to attack a variety of pines which can devastate vast forests. The last decade of milder winters have seen their numbers increase.



# RESEARCH STUDY AND NEXT STEPS

# Research Questions

- RQ1: How is problem-solving negotiated between learners and a simulated PAL?
- RQ2: Can rapid prototyping in virtual environments expose assumptions about instructional practices and improve the design of technology-mediated learning experiences?



## How is problem-solving negotiated between learners and a simulated PAL?

-  Participants only asked for help when they needed it, as a last resort
-  In competitive situations, participants wanted their communication with the PAL to be private
-  More research is needed to understand the underpinnings of discovery in problem-solving

Participants' expectations of a digital PAL often changed after initial use

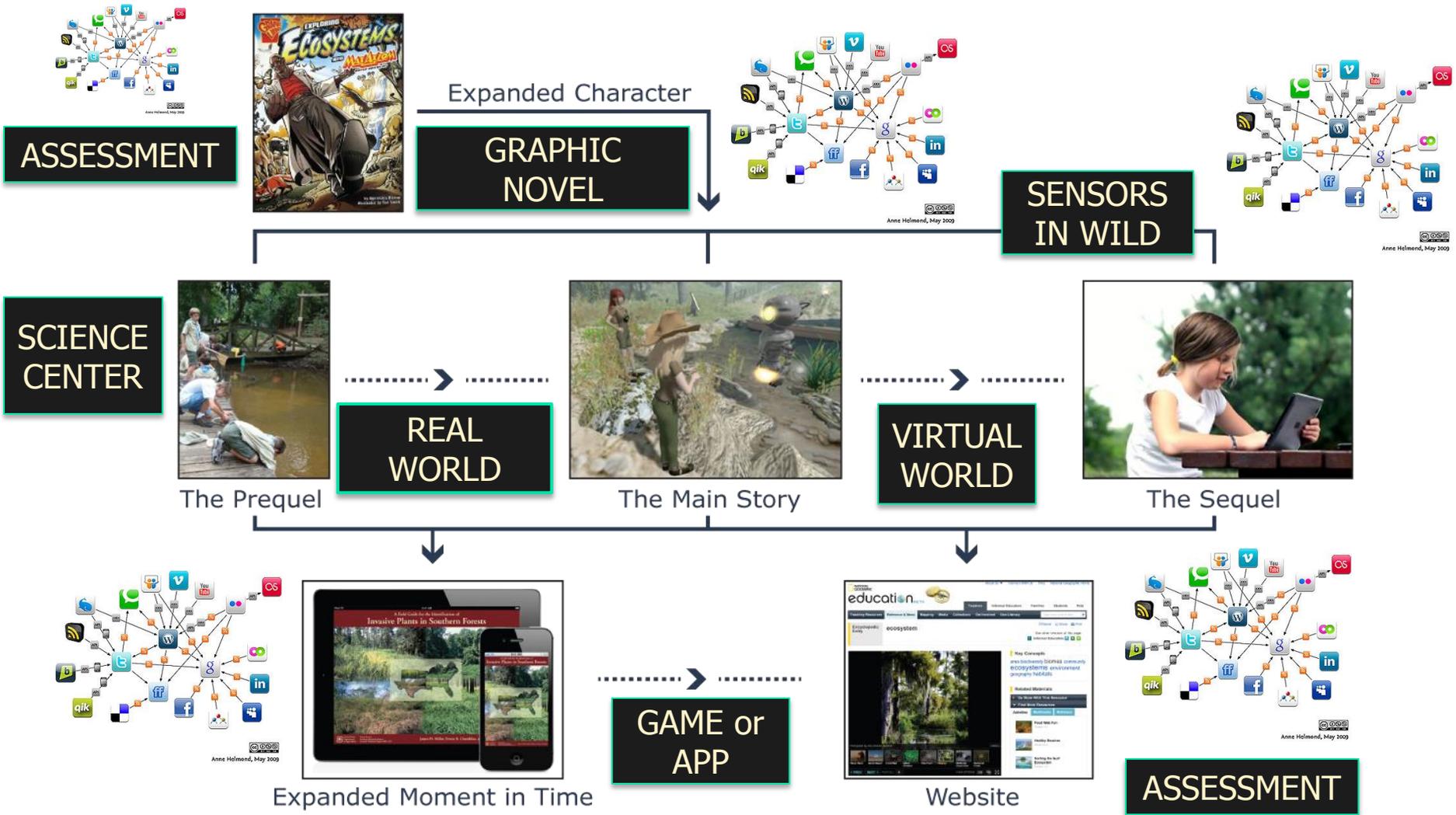
# Can rapid prototyping in virtual environments expose assumptions about instructional practices and improve design?

- ✓ Participants only utilized the PAL to answer questions or provide feedback, not as an equal partner in learning
- ✓ Participants reported they would have acted differently if they had not thought the scenario was a “game”
- ✓ More research is needed to understand adaptive performance in the context of common good dilemmas

Natural language and cross domain expertise may be necessary but not sufficient for the PAL

# CONCLUSION

# Transmedia learning system



(Raybourn, 2013)



# Share your story

A close-up photograph of a person's hand holding a grey rectangular card. The hand is positioned on the left side of the frame, with fingers spread. The card is held in the palm and contains text. The background is plain white.

**Elaine Raybourn, PhD**  
Research Scientist

<http://www.adlnet.gov>

Twitter: @elaineraybourn  
[www.linkedin.com/in/elaineraybourn](http://www.linkedin.com/in/elaineraybourn)