**Designing for the Cooperative Use of Multi-user, Multi-device Museum Exhibits**

### Goals

**For Software-based Science Center Exhibits**

- **Study purpose:** explore the design space for multi-user, software-based science center exhibits.
- **2 Design goals:**
  1. Be consistent with philosophy of playfulness of physical exhibits
  2. Be phenomenon-centric
  3. Be highly-interactive
  4. Allow all to access software input
  5. Allow all to access software output

### Design

**Individual User Interface Impact**

**Use Scenario**
- Large, shared display of simulation (plasma screen)
- Seating for up to 4 visitors
- Visitors use individual wireless devices (here, handheld computers) to play

### Pilot Study

**Questions:**
- do individual, private interfaces: distract users from attending to partners’ actions?
- affect users’ ability to participate in shared activity?

1. **Condition:** Individual input only
   - Input provided via handheld
   - No output via handheld
   - Least likely to distract
   - Lowest cognitive load
   - n = 14

2. **Condition:** Individual input & individual output
   - Input provided via handheld
   - Handheld output: screens display a “zoomed-in” region of the simulation
   - Likely to distract
   - Higher cognitive load
   - n = 15

3. **Condition:** Full implementation
   - Input provided via handheld
   - Handheld output: screens display output for chosen role
   - Likely to distract
   - Higher cognitive load
   - In situ = higher external distractions
   - n = 84

### Results

**Preliminary Analysis**

**Awareness:**
- Self-reported:
  - I was aware of how well my partners were doing at all times. (1-5, 1 = strongly disagree)
  - n = 14
- Expected:
  - n = 15

**Contribution:**
- Self-reported:
  - I was able to contribute as much or more as my partners did. (1-5, 1 = strongly disagree)
  - n = 84
- Expected:
  - n = 15

**Implication:**
- Players in 1 & 2 had same roles, should have been same rating
- Differences may make players more curious about, & in turn attend to, their partners’ actions
- Could counteract inherent distraction of individual output display.

**P(T <=t) two-tail**
- < 0.02
- < 0.005

**Possible explanation:** pace of game important factor to consider in multi-user exhibits.