Overview

- Define Assessment Mechanics
- Examples
- Criteria
- Implementation
Game Mechanics
Assessment Mechanics

• Design Approach for Game Mechanics for Learning

Game Mechanics

Learning Mechanics ⟷ Assessment Mechanics
Assessment Mechanics

- Patterns of behavior or building blocks of diagnostic interactivity
- May be a single action or a set of interrelated actions which form the essential diagnostic activity that is repeated throughout a game
- Goal: Optimize diagnostic power of a simulation or game
Assessment Mechanics

Examples of Assessment Mechanics

- Noticing of Errors (SLA)
  - in own output
  - in others’ output
- Noticing of correct actions
- Sort items (in time or space)
- Match items
- Complex sequences of actions
Assessment Mechanics

- Assessment Mechanic: Apply Rules to solve Problems
  - Learner selects among different rules and shows where/how they apply

Select the correct answer and drag it to the corresponding angle

Select the correct rule and drag it to the corresponding angle
Learning Mechanics

Game Mechanic: Apply Rules to solve Problems
(Variation)

- Learner selects role and shoots them at the target

Select the correct rule to and shoot it to the corresponding angle
Assessment Mechanics

- Game Mechanic: Angry Birds

Fling birds at target

Select different types of birds with different properties
Research: Assessment Mechanics

Assessment Mechanics Research

- Two assessment mechanics:
  - Solve missing angles by selecting correct number
  - Solve missing angles by identifying correct rule
Number Condition

Ch. 2 : Level 1

What is the value of this angle?
Rule Condition

YOU HAVE A NEW RULE BUTTON!
Assessment Mechanics

• Frameworks
  • Evidence-Centered Design (Mislevy et al)
    • Student/Competency Model (what should be assessed?)
    • Evidence Model (what behaviors reveal these constructs?)
    • Task Model (what tasks should elicit these behaviors?)

• “Proximity" or "Just in Time" Model
  • When should tasks be assessed? Before, during or after a task, or a
    combination of those, depending on task, context and educational goal.
Assessment Mechanics

Criteria for Assessment Mechanics

- Based on ECD Evidence Model
- Describe Aspects of ECD Task Model
- Test Theoretical Concerns
- Make explicit the cognitive processes learners used for problem solving
- Assessment character may or may not be obvious to learner
<table>
<thead>
<tr>
<th>Assessment Mechanic</th>
<th>Game Mechanic</th>
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<tbody>
<tr>
<td>Learners apply rules to solve problems</td>
<td></td>
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<tr>
<td>Learner chooses how different items are to be arranged in space and time in order to solve a problem</td>
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<tr>
<td>Learner selects different items that belong to each other in time or space</td>
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Assessment Mechanics

Requirements for Designing Game Mechanics based on Assessment Mechanics

- Reduce extraneous cognitive load
- Consider germane cognitive load/mental effort
- Other confounds:
  - Fine motor skills
  - Content knowledge or skills
  - Emotional Response (Bird Anger)
User Logs

Log file open standard for game research

- Tags: Common Core Standards, Skills, ...
- User actions
- Game Events
- Biometric Data