The Fairy Performance Assessment: Measuring Computational Thinking in Middle School

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Project Overview

- Storytelling Alice & Alice 2.2
- Elective technology classes
- 325 middle school students
- 311 completed assessment
- Solo or programming pairs
- ~20 hours
Assessment Design

- Story-narrative
- Fixing faulty program & adding functionality
- Motivating
- Post only
- Individually completed
- ~30 minutes to complete
- Instructions delivered via characters & print
Measuring Computational Thinking

Three tasks to measure:

- Algorithmic thinking
- Abstraction & Modeling
Alice “Fairy” world

1. Make Halo watch LeafFlame walk into the forest.
2. Fix program so pressing the up arrow returns LeafFlame to original size.
“Resize” Task

Make pressing the up arrow work right and return LeafFlame to his original size.

Challenges student to:

• Understand events
• Recognize faulty event handler
• Think algorithmically
• Repair faulty method
Faulty code
Partial points

- When the world starts, do World.scene 1 method
- When ↑ is typed, do LeafFlame.returnToSize
- When Enter is typed, do World.checkDone
- When ▼ is clicked on LeafFlame, do Nothing

- World.scene 1 method

LeafFlame.returnToSize

No parameters

- LeafFlame resize 2 more...

- If LeafFlame is smaller than Halo
  - LeafFlame resize 0.5 more...
  - Else
    - LeafFlame resize 2 more...

- If LeafFlame is smaller than Halo
  - Halo say Oh No! Leaf Flame got smaller more...
  - Else
    - Halo say Oh Yeah! Leaf Flame is his original size more...
Contributions

- Student transfers knowledge
- Motivating to students
- Range of computational thinking
- Modified for other programming environments
Still to come...

- Scratch assessment
- Solo/pair programmers; girls/boys
- Measuring aspects of computational thinking
- Learning analytics
More information

- Linda Werner: linda@soe.ucsc.edu
- Shannon Campe: shannonc@etr.org
- Alice & Scratch --- Friday 3:45pm 302B
  *Children Learning Computer Science Concepts via Alice Game-Programming.*