IIS Seminar

Computer Human Interaction: Improving Computing for Novice Programmers

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Introduction

In classrooms, computers are only used for drill and practice.
- Reduces mundane tasks
- Does little to develop higher-order reasoning and problem-solving skills
- Students learn more from exploratory learning (e.g. simulations)

Create a new simulation creation environment that empowers teachers as authors and resource developers
1. evaluate existing environments
2. develop and refine a new set of tools that emphasize minimalism and reuse
Challenges: Teaching Practice

- A segment of a larger effort to promote science learning
- Teachers are busy
  - Limited time to learn new technologies
  - Limited time to build materials
- Teachers won’t use software if it doesn’t meet their needs
  - Make it easy to satisfy their specific needs
- Minimalist instruction which emphasizes rapid start-up and meaningful tasks.
Research Process

Initial Requirements → Empirical Evaluations → Design

Intrinsic Evaluations → Mediated Evaluation & Field Test → Prototype → Formative Evaluation
Agentsheets: more sophisticated with an environment conducive for exploration and reuse at various levels.
Stagecast: great for simple demos, (e.g., at the level for younger kids).
Programming in SimBuilder

- mover
  - emptyScript
  - copy
  - move
  - mouseDown
  - normal

- basic
  - mover's x
  - mover's y
  - mover's heading
  - mover's forward by
  - mover's turn by
  - mover's makeSound

- test
  - mover's isOverColor
  - mover's isUnderMouse
  - mover's color
  - mover's touched
  - mover's abtrudes

- mover move normal
Teacher Creations

User Created Volcano Models

Reuse Study Example Results

User Created Ocean Models

User Created Photosynthesis Model
Rules of interface design – Shniederman
- Strive for consistency, informative feedback
- Design dialogs to yield closure
- Error prevention and simple error handling
- Support undo and reduce short-term memory load.

First rule of usability? Don’t listen to users – Jakob Nielson
- Conducted series of experiments to become familiar with user population and gathered user task profiles
  - Fun Learning Stagecast Creator. Seals, Rosson, Carroll, Lewis, Colson
  - Community Design of Community Simulations. Rosson, Carroll, Seals
  - Teachers as Simulation Programmers. Rosson, Seals
Work to Do

- Usability Evaluation of Systems & Studies with Users
  - Study learning, motivation, etc.
- User Interface Design
- Improve Existing Systems
- Develop Systems that meet our user’s needs
- Support needs with software and with virtual communities
Virtual Communities

Community Sims

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