Overview

- Research on Learning from Video Games and Simulations
  - Types of Research
  - Research Methods
  - Data Analysis Approaches

Group Activity

- Discuss approaches to research on games in the assigned papers (10 min., Groups of 3-4)


  - What were the goals and methods of the reported research?
  - What kind of data was collected?
  - What conclusions were drawn?

  - Take notes and report back to class

Game Research

- Types of Research
  - Usability
  - Process
  - Outcomes/Effectiveness
  - Evaluation vs. Generalization
Evaluation

Goal: evaluate game with respect to given criteria

Usability
Each of one

Efficacy

Evaluation Methods

Surveys
Interviews
Think-aloud protocols
Walkthrough techniques
Video mapping of user behavior
Log files of user actions
Heuristic Evaluation/Expert Evaluation
Experimental/Quasi-Experimental Designs

Game Usability:
Mapping of user behavior in Helo 2

Player locations color coded [in interval]

Visualization of player deaths

Efficacy Evaluation

Goal: compare game efficacy to a standard

Form of media comparison

Does not typically provide theoretical insights

Useful for policy decisions

Data Analysis

Goal: compare game efficacy to a standard

Collection of pre-test data, post-test data

Comparison of change for treatment and control
Class Discussion

What purpose does evaluation research serve?
Discuss questions that evaluation research can/cannot answer.

Presentation

Presentation of a game related to today’s topic
(1 group - 10min.)
Research on Games and Simulations

Game Research

Process

What process data are of interest to us?

Exploration Strategies
Social behavior
Learning processes
Non-gaming/learning behavior

Game Research

What process data are of interest to us?

How are process data collected?
Think-aloud protocols
Videotaping of user behavior
Log files of user actions
Artifacts
Conversation/IM/mail logs
**Game Research**

- Data analysis?
  - Discourse theory / discourse analysis (Gee/Steinkühler)
  - Cognitive Task Analysis → patterns
  - Frequency counts
  - Rubrics

**Class Discussion**

- What purpose does process research serve?
  - Discuss questions that process research can/cannot answer.

**Game Genres**

- Outcomes/Effectiveness

**Game Genres**

- Quest Atlantis (Barab)

**Game Genres**

- RiverCity (Dede)

**Game Research**

- What outcome data are of interest to us?
  - Knowledge outcomes
    - Recall
    - Comprehension
    - Transfer
  - Affective outcomes
    - Attitudes
    - Interest, Motivation
    - Self-efficacy, Self-esteem
    - Emotions
**Game Research**

- How are outcome data collected?
  - MC tests
  - Comprehension/recall tests
  - Open-ended problem solving transfer tests
  - In game tests (MC, problem solving)

- What other data are collected?
  - Mediating and moderating variables
  - Demographic data
  - Learner characteristics
  - Environmental variables

- Data analysis?
  - Scoring of tests
  - Rubrics to score problem solving tests
  - Comparison of pre/post differences for different treatment groups (t-test, ANOVA, regression analysis)

**Class Discussion**

- What purpose does outcome research serve?
  - Discuss questions that outcome research can/cannot answer.

- Out of Class Activity
  - Play a game!
    - Play a computer/console game in CREATE – tonight!
  - Design an educational game!
    - Select project for development on an educational game
Out of Class Activity

Educational game topics to choose from:
- K12 Inc.: Misconceptions in Science Education
- G4L Institute: Game to elicit and display user responses
- M&M: Turn simulation into game
- ECT promotion game for ECT web site