

Failure, Fun and Learning

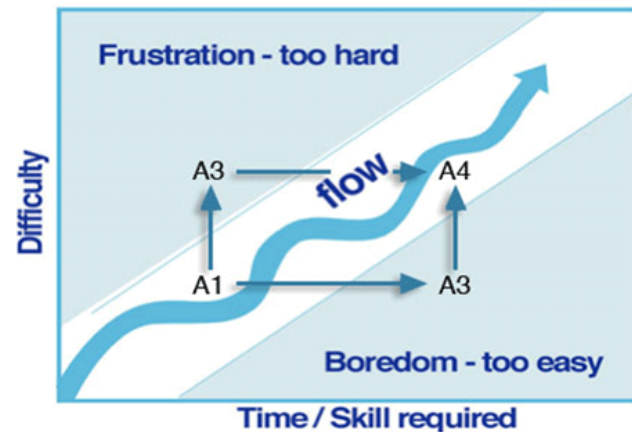
Making and Playing an Educational STEM Game

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Analyzing a Game

- ◆ Design and Development
- ◆ Literacy and Mastery
- ◆ Gameplay and Learning



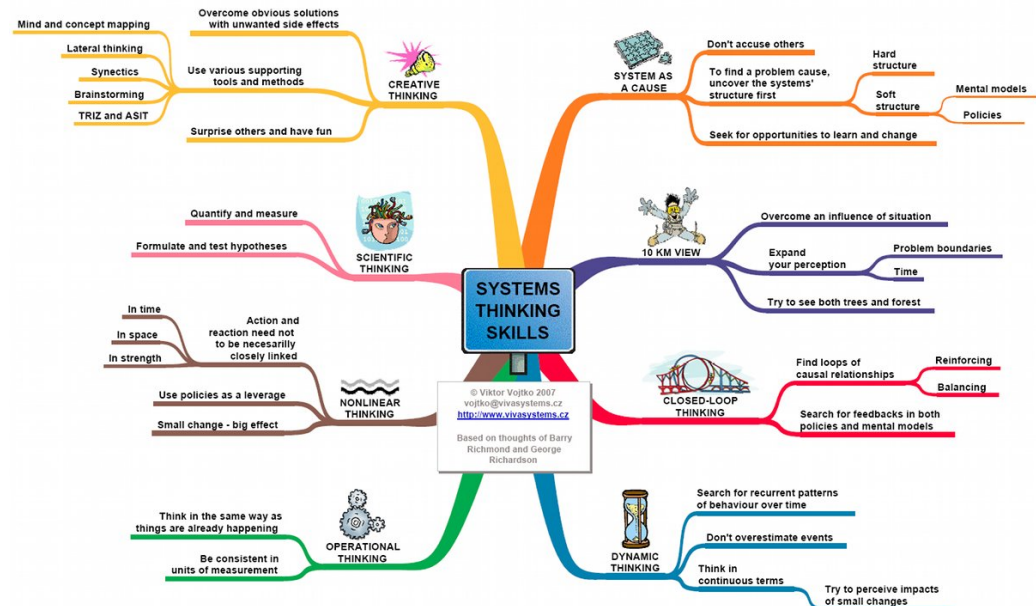
Context

💧 MacArthur Foundation

💧 Field Museum

💧 STEM

💧 Systems Thinking



Bridges

- ◆ Graduate Student Project Team
- ◆ Iterative Rapid Prototyping
- ◆ Gameplay Experience
- ◆ Meaning & Value



Invasion!

- ◆ Raise Awareness of Invasive Species
 - ◆ Asian Carp
- ◆ Science in Context
 - ◆ Complex Issue in our Culture



Asian Carp

- ◆ “Smithsonian Institution scientists fear that unless somehow checked, the outsize Asian carp, which has few, natural enemies, will make rivers virtually uninhabitable for other fish”
- ◆ Pittsburgh Press, 1975



Invasion!

- ◆ Simulation, Tower Defense, Card Mechanic
- ◆ 10-20 Minute Experience
- ◆ Minigame – Carp
- ◆ Main Game – Carp Czar

The Field Museum

The Field Times

Asian Carp Spotted in Lake Michigan Waterways!!

Originally brought to the US in the 1970s to control algae growth in water treatment plants, these voracious eaters escaped into the ecosystems of the Mississippi and Missouri rivers. Asian carp out-compete other native species for food, dominating their environment. Now the Asian carp are moving north toward the Great Lakes. We don't know for sure what will happen if the fish reach Lake Michigan, but there is potential for great harm to be done, both to the environment and local fishing industries!

[CLICK HERE TO CONTINUE](#)

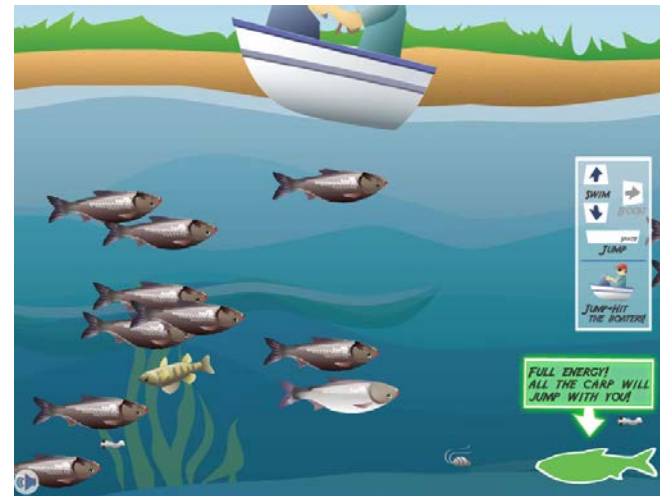


Play

- Intro Game

Introductory Game

- Play as Carp
- Minigame
- Introduce Issue
- Impact Simulation Game



Gameplay

- ◆ Introductory Game
 - ◆ Hook
- ◆ Simulation Game
 - ◆ Science in a System
 - ◆ Hard to Win



Play

- Simulation Game

Simulation Game

- 🟢 Tower Defense
- 🟢 Turn Based
- 🟢 Card Mechanic
 - 🟢 Engage Various Socio-Political Groups



Play

- ◆ More Simulation Game

Gameplay

- ◆ Engage, Act, React
- ◆ Expendable Resources, Public Will, Money
- ◆ Building, Maintenance, Decisions
- ◆ Multiple End States



Learning the Game

- ◆ Hidden Mechanics
- ◆ Connect Intro Game to Simulation Game
- ◆ Difficulty
- ◆ Feedback on Decisions and How to Win
- ◆ Clarity on Mechanics and Choices



Play

● End Game

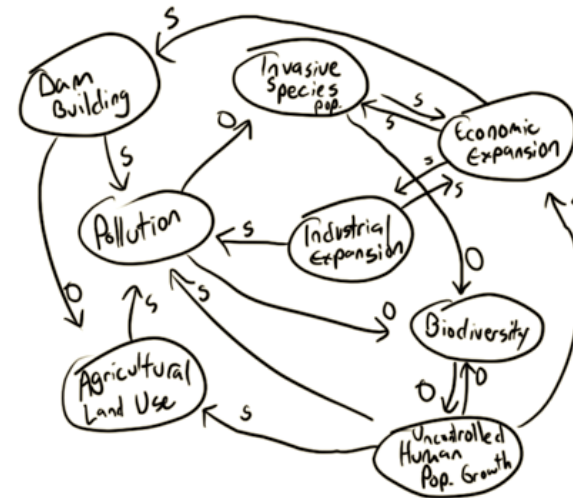
Educational Opportunities

- ◆ History, Current Events, Systems Thinking
- ◆ Ecology, Biology
- ◆ Complexity and Difficulty



Making the Game

- ◆ Iterative Process
 - ◆ Playtest
- ◆ Design Evolution
 - ◆ Initial, Interim, Final
- ◆ Real World Problem
 - ◆ Events Happening as Game Was Designed
 - ◆ Technical Solutions to Help Design Adapt



Post-Mortem

- What went Right
- What went Wrong
- Lessons Learned
- Conclusion



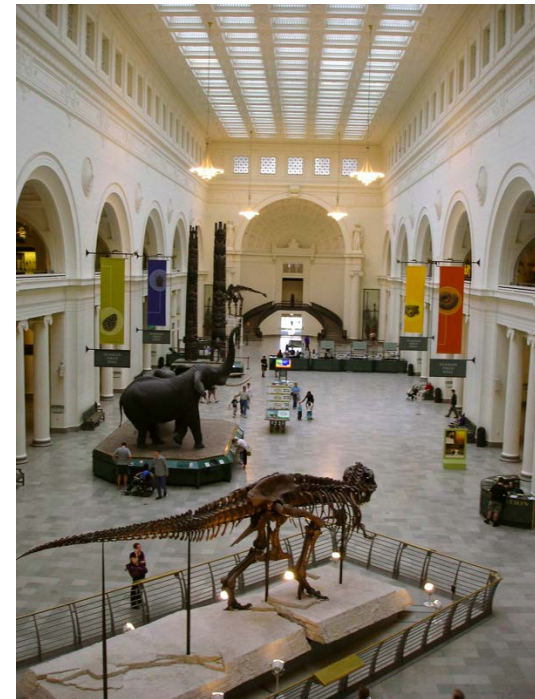
Literacy & Mastery

- ◆ Design & Development
- ◆ Gameplay & Learning
- ◆ Interpret & Analyze



And Now

- ◆ Invasion! in the Field Museum



Thanks!

💧 Questions?

