ITERATIVE, LOW-COST ANALOG SIMULATION FOR MEDICAL EDUCATION

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[Presentation Notes]

Overview

Who I am

- Jason Morningstar
- Bully Pulpit Games
- Worked in partnership with UNC, UM, Kaiser, ILN

What I am Talking About

- My main point is that you can and should be looking for opportunities to create engaging, low tech games, exercises and simulations. Your students will thank you.

What I am not talking about

- Theory or prior research
- Assessment or outcomes
- Anything that costs more than ten dollars to implement

Key Points

- Small analog games are easy to instantiate
- They have a useful place in your pedagogy
- You can make your own

Fast, Cheap or Good - Choose Any Three

[Image]

Iterative, Low Cost, Analog, Simulation

- Simulation means a structured activity designed to emulate real stuff.
- Analog means non-digital. No computers. Pencil and paper. Index card and sharpie.
- Because it is analog, it is going to be low cost and rapid iteration is easy.

The Fidelity-Friction Ratio

- There's a Friction to Fidelity ratio.
- Unless you are actually doing the actual thing, high fidelity trends toward high friction.
- Computer simulations are high fidelity/high friction and many people's default assumption when you say "game".
- Analog games are low fidelity/low friction and often the right tool for the job
- Simulation can happen at any fidelity. Analog simulation in the form of low cost, highly iterative games, is very low fidelity. And that's OK! It won't be good for everything. Computers and complex systems like patient simulators are great at high fidelity.

The Fidelity-Friction Model

(chart)

Panic On The Pediatric Ward

(Image)

The Five Children's Game: Development

[SLOW DOWN AND TAKE A LITTLE TIME EXPLAINING THIS]

- A School of Nursing faculty member had a problem. Her nursing students experienced a lot of stress on their pediatric rotation and forgot their entire orientation. She asked me to fix this problem.
- The traditional orientation was the professor lecturing them what they needed to know - the layout of 5 Childrens, where the bedpans were kept, the code to the Pyxis machine, and so forth. The students forgot it all as soon as they encountered sick kids.

The Five Children's Game: Design

- With the buy-in of faculty and the ward staff, I turned the orientation into an on-ward treasure hunt where the students would compete in dyads to complete rotation-specific tasks.
- The design involved atomizing the locations and skills that student nurses would need to demonstrate on 5 Childrens during their rotation and turning them into discrete tasks.
- Each task was put on a color coded index card and these were assigned randomly. Every dyad chose how to accomplish their tasks and in what order. Tasks involved navigating the physical, social or procedural space of the floor; demonstrating knowledge; and reinforcing necessary skills or information.
- Because celebrities often visit the childrens hospital, the 5 Childrens game included a card for dealing with a visit from Dwyane The Rock Johnson. because that was surprising and funny and also real.

The Five Children's Game: Execution

- Since all this information came from a subject matter expert it was very easy for me to organize and execute. The hardest part was persuading floor staff to participate.

- Being focused under intense time pressure on a competitive task was effective in two ways: High engagement and loss of anxiety over the environment

- Some students gleefully cheated, which was a good sign.

You Can Do It Too!

[Image]

Make Your Own: Development

- Pick a problem that cries out for a low fidelity/low friction solution

- Development models for the design of instructional/edutainment video games work fine for other form factors and types of game, and edu-game frameworks are fairly consistent (Norman, 1994; Weitze & Ørngreen, 2011; Weitze 2016).

- Norman's model includes providing high intensity interaction and feedback, specific goals and established procedures, motivation and challenge. Sounds good to me.

Make Your Own: Design

- Think quick and dirty. Think tactile and kinaesthetic. Think movement and embodiment. Don't be afraid to rely on proven technology - you can steal from existing games (UM Hanabi model)

- Consider the audience (cognitive ability, tactile ability, mobility, learning style, ability to absorb concepts, complexity) inclusivity (Richard 2016)

- Include humor. Low fidelity = lighten up a little.

Make Your Own: Execution

- Make your game or activity engaging. Consider cheating as a benchmark of engagement. Raph Koster (2005) suggests that cheating is bad and James Paul Gee (2004) argues for low-stakes failure, but I am pro-cheating.

- Iterate ruthlessly. When you can, utilize a design-build-test loop playtest model, failing early and often (Fay 2016).

Conclusion

- Small analog games are easy to instantiate

- They have a useful place in your pedagogy

- You can make your own

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