Effective Serious Games

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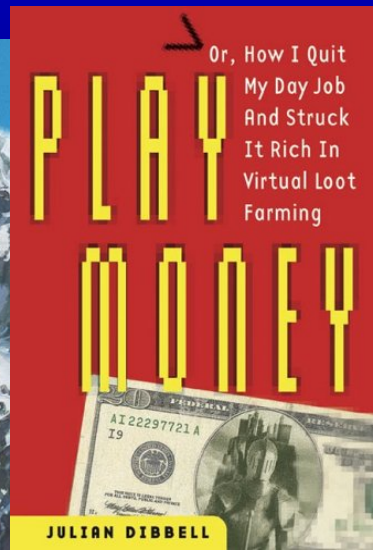matthias.a.spruill@saic.com

Outline

- **Serious Games Definitions**
- **Active Domains**
- **Effectiveness of Medium**
- **Future Directions**
- **SG Events**

Why are games important?

"Play is to the 21st century what steam was to the 19th century" - Power that can be harnessed for social and economic benefits.

Dibbell, J. (2006). *Play Money.* Basic Books

1970 Serious Games Definition

"Reduced to its formal essence, a game is an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context. A more conventional definition would say that a game is a context with rules among adversaries trying to win objectives.

"We are concerned with <u>serious games</u> in the sense that these games have an <u>explicit and carefully thought-out educational purpose</u> and are not intended to be played primarily for amusement."

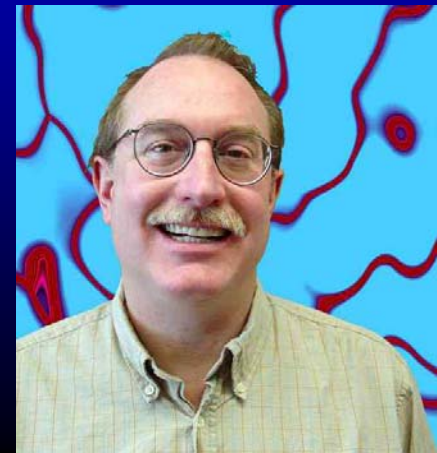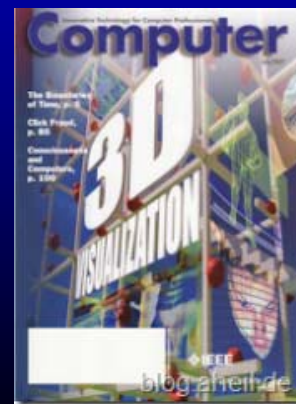Abt, C. (1970). *Serious Games*. New York: The Viking Press.
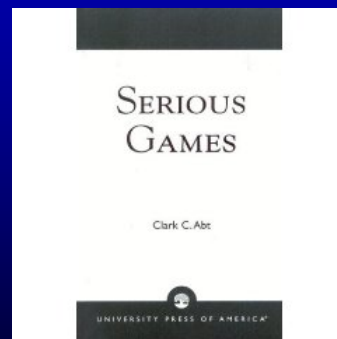
2005 Serious Games Definition

Game: "a physical or mental contest, played according to specific rules, with the <u>goal of amusing or rewarding</u> the participant."
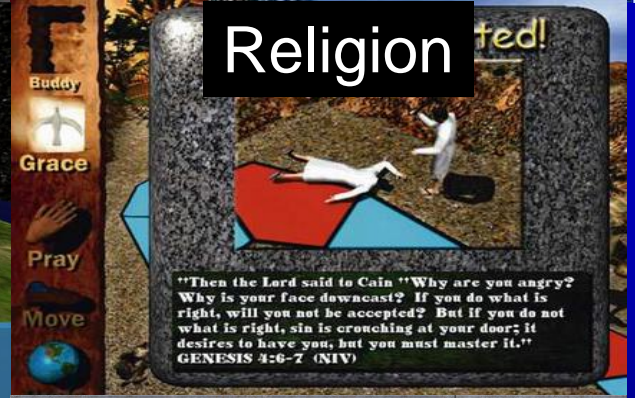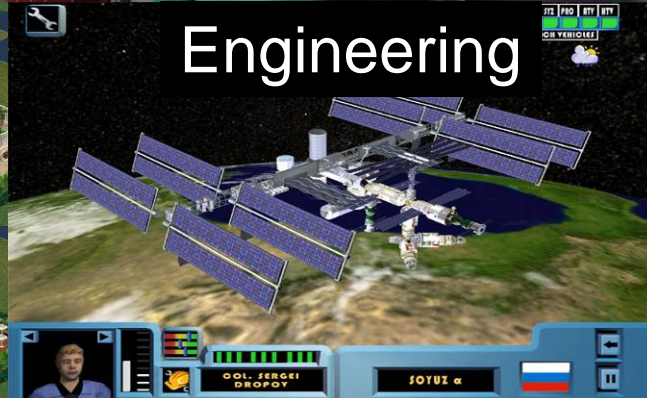
Video Game: "a mental contest, played <u>with a computer</u> according to certain rules for amusement, recreation, or winning a stake."

Serious Game: "a mental contest, played with a computer in accordance with specific rules that <u>uses entertainment to further government or corporate training</u>, education, health, public policy, and strategic communication objectives."

Zyda, M. (September 2005). "From visual simulation to virtual reality to games". *IEEE Computer*.

Industries Adopting Game Tech

Military

Medicine

Emergency Mgt

City Plan

Engineering

Religion

Space Explore

Machinima

Politics

Military Serious Games

Iraqi Lang Trainer

AMBUSH!

VBS2

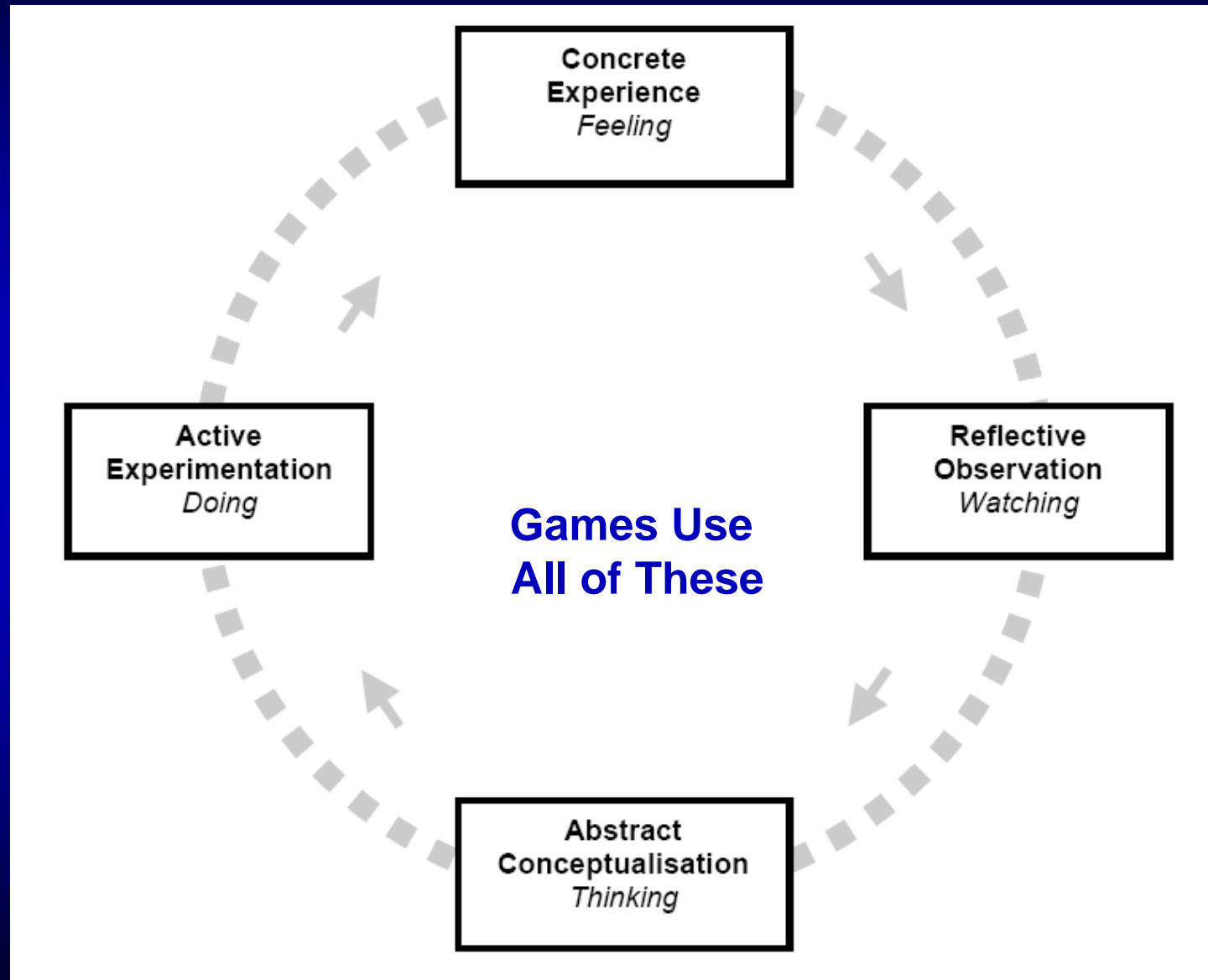Americas Army

Full Spectrum Warrior

Tactical Questioning

Measures of Effectiveness

- **Education – degree to which people learn**
- **Cost – price to achieve equivalent learning**
- **Marketing – price to deliver a message**
- **Familiarization – ability to understand people, places, objects, and events without the real encounter**
- **Therapy – improving psychological or physical condition**

Kolb's Learning Styles

Kolb, D. (1984). *Experiential Learning: Experience as the source of learning and development.* Prentice-Hall.

In-Game Learning Characteristics

- **Increasing Complexity**
  - **From Passive, to Experimental, to Active, to Proficient**
- **Constructivism**
  - **Building the players internal understanding of the game world**
- **Opportunity to Redo**
  - **Free to make mistakes**
- **Feedback**
  - **Action – immediate response**
  - **Strategic – long term effects**
  - **Results – rewards for accomplishment**

Aldrich, C. (2009). *The Complete Guide to Simulations and Serious Games*. Pfeiffer Publishing.

Effective Game System Qualities

- **Ease of Install**
- **Self-Explanatory Start (with or without manual)**
- **Clarity of Learning Objective**
- **Backstory Development**
- **Clarity of Play Objective**
- **Play Mechanics**
- **Usability of Interface**
- **Quality of Learning Achieved**
- **Scoring/Measurement Method**
- **Student Performance Feedback**
- **Richness of Environment (Replayability)**
- **Innovative Concepts (WOW! Factor)**
- **Applicability to Multiple Domains (with skin change)**

Evaluation Method

Evaluator:	Game Wizard																	
Criteria	Qualify as Serious Game (Y/N)	Ease of Install	Self-Explanatory Start	Clarity of Learning Objective	Backstory Development	Clarity of Play Objective	Play Mechanics	Usability of Interface	Quality of Learning Achieved	Scoring/Measurement Method	Student Performance Feedback	Richness of Environment	Innovative Concepts	Applicability to Multiple Domains	Total Score	Weighted Score	Percentage (based on weighted Score)	Comments
		Score 1 (Low) to 5 (High)																
Weighting		1	1	1	1	1	1	1	2	1	1	1	1	1				
Great Game	Y	5	3	4	3	2	3	2	3	4	5	3	4	3	44	47	72%	This is a really great concept that teaches people how to assemble widgets into bigger wotchets safely and efficiently. The game is a prototype so it requires some study to figure out the objective and how to work the controls.
Sad Game	Y	1	2	3	2	3	2	2	3	1	1	5	3	1	29	32	49%	The game is very difficult to install and it is not clear how the player is supposed to get started. There is no story, no scoring, and no feedback. But they used the new GameEngine7 which has awesome graphics.
Not a Game	N	5	5	3	4	4	3	4	3	3	3	2	1	2	42	45	69%	This is a really nice web-based training course. It included a small snippet of game video to provide the backstory, but it does not really use game technology in conveying the lesson. I think it does not qualify as a Serious Game according to the definition for this contest.
etc.															0	0	0%	
															0	0	0%	

Future Directions

- **Web-based Games**
  - **Direct Action, Quake Live**
- **Virtual Worlds**
  - **Second Life, There**
- **Mobile Games**
  - **Cell phone, Netbook**
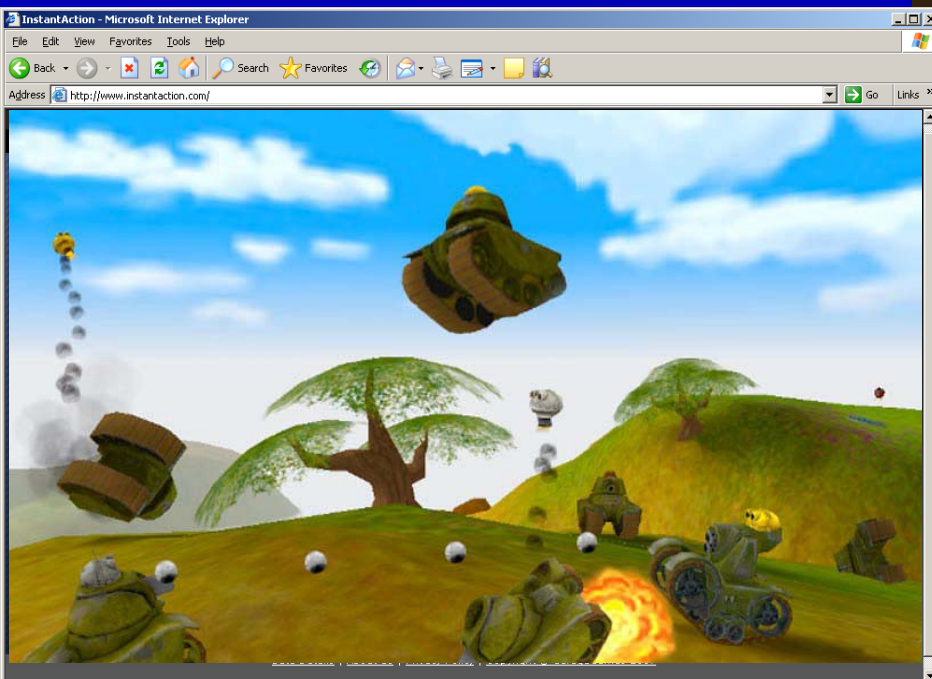
Serious Games Events

- **Serious Games Showcase & Challenge**
- **Game Developers Conference, Independent Game Festival**
- **Serious Games Initiative & Summit**
- **Federal Virtual Worlds Consortium**
- **Defense GameTech Conference**

Discussion Portals
- **http://www.seriousgames.org/**
- **http://seriousgamesportal.blogspot.com/**
- **http://www.seriousgamessource.com/**

Serious Games Showcase & Challenge

- **Using Serious Games to identify innovative game-based solutions to training problems**
- **Challenge is open to student teams, small and large business, and government**
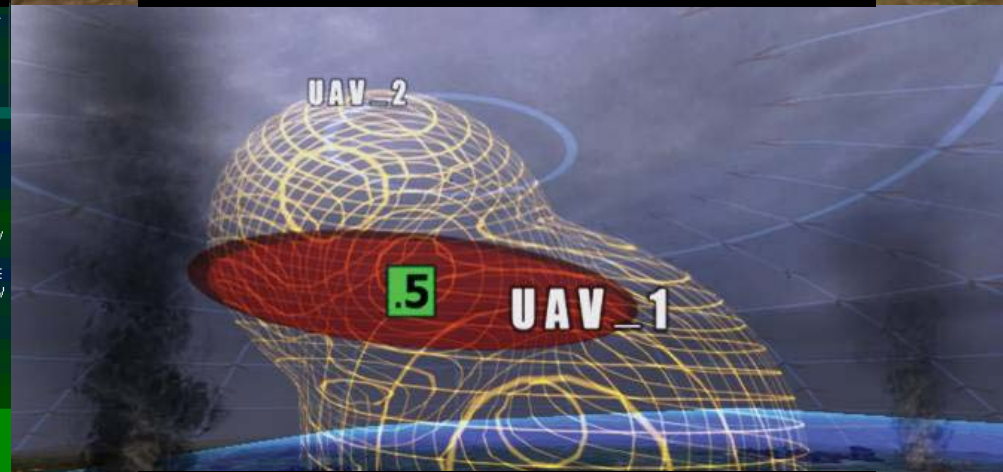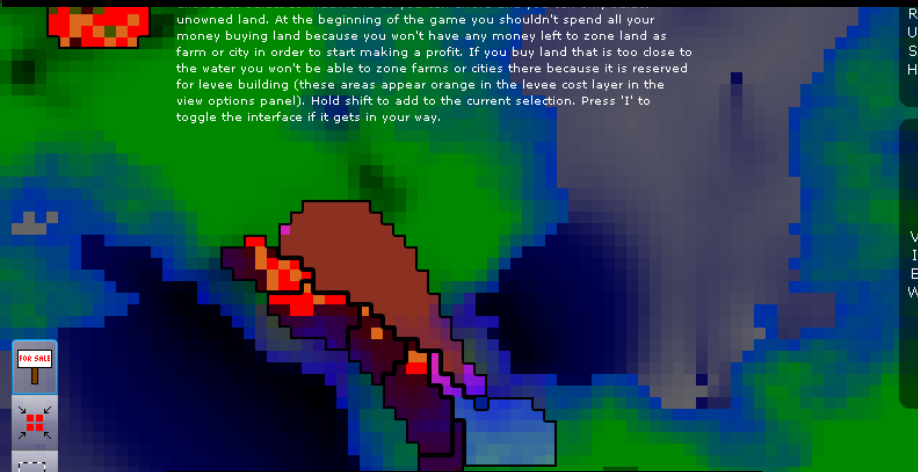

2006   2007   2008   2009

2008 SGS&C Winners

Small Business & Overall: Burn Center

People's Choice: Direct Action

Student: Age of Ecology

Government: Geo Commander

2009

http://www.sgschallenge.com/

References

- Abt, C. (1970). *Serious Games*. New York: The Viking Press.
- Aldrich, C. (2009). *The Complete Guide to Simulations and Serious Games*. Pfeiffer Publishing.
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- Serious Games Source. http://www.seriousgamessource.com/