

serious games: serious opportunities

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overview

serious games

- games v school
- games + learning

serious opportunities

- landscape
- case studies
- comparison + contrast

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overview

serious games

- games v school
- games + learning

playing with our minds

serious opportunities

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- case studies
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overview

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playing with our minds

serious opportunities

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strategies for success

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my background

- physics, media production, iTV games
- interested in media for learning
- doctoral research an inquiry into game design for learning physics (2003)
- ...leads me to my current research into the connections b/w games (digital, board...), play, design + learning...incl. 'serious games'

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serious games

- Serious Games Summit (GDC'04, DC'04)
- Games that shift their core focus from entertainment to education



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serious games

Why Videogames are Cool + School Sucks!

- (AGDC'03) + www.andrewstapleton.com
- That paper explored games as learning technologies + compared the learning in games with that of traditional school education


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games v school



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games v school

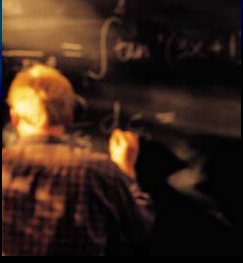


- Activity directed by player
- Player-centered
- Players learn through exploring and experimenting within the game world
- Learning process

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games v school

- Activity (curriculum) typically directed by teacher
- Teacher-centered
- Transfer of knowledge from teacher to learner
- Teaching process



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games v school

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Learning is not simply the inverse of teaching

- Activity directed by player
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games + learning



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games + learning

academics

- Don Norman
- Seymour Papert


game designers

- Chris Crawford
- Bruce Shelley
- Nolan Bushnell

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don norman

"To play a game well requires the same kinds of learning, study, understanding, and practice as are required of any educational activity"

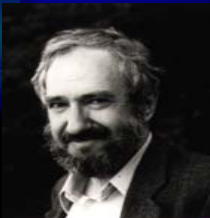


<http://www.ind.com/NNa/Photographs/NNa-photos/nnha.html>

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seymour papert

"[i]f their [the game studio's] public failed to learn, they would go out of business"




<http://web.media.mit.edu/~papert/>

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chris crawford

"Games are...the most ancient and time-honored vehicle for education. They are the original educational technology, the natural one, having received the approval of natural selection"




www.gdconf.com/media/2004/photos/Conference%20Classes%20%20Speakers/004240-B01-2038-18.jpg

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bruce shelley

"entertain the player by engaging their mind"




<http://www.assembll.com/outreach/shelley.html>

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nolan bushnell

"I felt that the technology that we were developing was going to fundamentally revolutionize education."



Game Developers Conference
Gamasutra

'Legends of Game Design' lecture at GDC 1997 (see Best of GDC DVD 1997-2003) [tc:13:13]

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games + learning

- knowing **what**
- knowing **how**
- knowing **why**

... the buttons/keys do (e.g., ps2 x, o)

... the different objects in the game are + do (e.g., player + non-player characters, objects with the game environment...)

... the feedback means (e.g., length of health bar, hud...)

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games + learning

- knowing **what**
- knowing **how**
- knowing **why**

...to move the game character

...to change the level of difficulty

...to unlock the door, buy more land, reach the top of the mountain, slay the dragon...

<http://www.fbe.net.au/~stayford/einstein.html>

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games + learning

- knowing **what**
- knowing **how**
- knowing **why**

...an event occurs (e.g., "why does the spacecraft move like that?", "why do property values decrease in industrial areas?"...)

<http://www.fbe.net.au/~stayford/einstein.html>

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games + learning

- knowing **what**
- knowing **how**
- knowing **why**

• facts + information

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games + learning

- knowing **what**
- knowing **how**
- knowing **why**

• facts + information

• skills + competencies

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games + learning

- knowing **what**
- knowing **how**
- knowing **why**

- facts + information
- skills + competencies
- relationships + ideas

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players as learners

- so, players learn a variety of things by playing games incl.
 - facts + information
 - skills + competencies
 - ideas + relationships
- can consider 'players as learners'
- ...now with a brief outline of serious games, lets explore some opportunities...

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serious opportunities

- Serious games offer solutions to problems
- Games are systems of interaction...
- Anywhere there's a system there's probably a game (but how good a game it is...that's something else!)
- ..now lets get a lay of the land of opportunities...

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serious games landscape

•K-12 Edutainment

•Higher Education	•Military
•Health Care	•Non-Government
•Corporate	•Other

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K-12 Edutainment

- not considered a key market (gdc'04)
- large no. of 'skill + drill' titles available
- 'Games in Education Conference' (E3'04)
Education Arcade (www.educationarcade.org)
- e.g. Broderbund, Learning Company...

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Higher Education

- great potential as a market
- ability to fund projects
- collaboration b/w industry + universities
- can assist in making products
- research explores new applications
- variety of different applications
- research + development opportunities

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Health Care

- being pursued by serious games community in the US
- 'Games for Health' Conference
Games for Health (www.gamesforhealth.org)
- possible applications
 - treatment of phobias
 - distraction during certain procedures
 - physical/behavioral therapy



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Corporate

- Possibly the most lucrative
- Very diverse...
- many different industries...
 - Manufacturing
 - Transport
 - Agriculture
 - Construction...
- + potential applications
 - from advergame to complex training simulations



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Military

- Already long-term + avid adopters of games for training
- they invest heavily in games + simulations for training + recruiting purposes
 - e.g. Americas Army



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Non-Government

- Not-for-profit organizations
 - Greenpeace, red cross, salvation army, amnesty....
- ...just b/c they are non-profit, doesn't mean that they are unable to fund serious game projects



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Other

- Everything else...
- Game journalism
- Political games (www.newsgaming.com)
-



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Case Studies

- Virtual-U
- VR Phobias (games solutions to problems)
- Hazmat



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Virtual-U

problem

- need to foster better understanding of management practices in American colleges + universities

solution

- design a game where role of university president
 - responsible for establishing + monitoring the major institutional elements (e.g., salaries, research funding, campus parking)
- www.virtual-u.org



Virtual-U



Virtual-U



VR Phobias

problem

- VR environments expensive
- VR environments not available for all disorders to be treated via 'exposure therapy'

solution

- use off-the-shelf computer + videogames (+ sometimes modify)
- www.vrphobias.com

<http://www.securgames.org/caseblist/vrphobia.cgi>



VR Phobias

examples

- Midtown Madness
 - fear of driving
 - agoraphobia
- Need for Speed
 - fear of driving
- Operation Flashpoint
 - distraction during dental procedures



VR Phobias

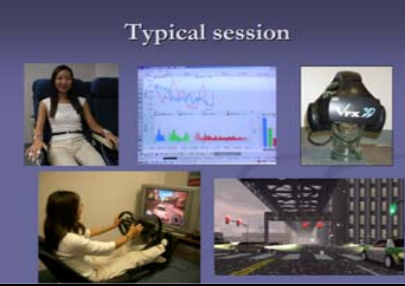
examples

- Unreal Tournament (mod)
 - fear of...
 - spiders
 - heights
 - darkness
 - snakes
 - claustrophobia



VR Phobias

Typical session



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VR Phobias

- implemented in 3 clinics in the USA
 - San Diego, Santa Monica, Palo Alto
- report a high success rate (94%) + low drop-out rate (4.5%)

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Hazmat

- **problem**
- firefighters need higher quality + more frequent training to be prepared for terrorist attacks
- (post-9/11)

- **solution**
- modify a commercially available game
 - (Unreal Tournament)
- integrate game-based training within the training program

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Hazmat

- game-based training supplemented by other methods of education; lectures + field training


Lecture

Game-Based Training

Field Training

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Hazmat



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Hazmat

- implemented via LAN party classroom
- players could talk to each other
- trainers could modify events, objects + environments

issue

- one issue that arose for this type of "realistic" game is the need for attention to detail
- e.g. color of boots + clothing etc.

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comparison + contrast

some issues

- learning outcomes
- implementation
- budget
- collaboration
- technology



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learning outcomes

- skill + procedures
- facts + information
- understanding + relationships
- outcome is important as it will direct metrics for evaluation
 - (e.g., tests good for evaluating facts but not as good for evaluating understanding)
- is a game the most suitable solution?



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implementation

- variety of implementation environments
- Uni/home, LAN classroom, clinical practice
- also consider game as part of a broader context of learning
 - e.g., Hazmat = lecture + game + field exercise
- all the learning doesn't have to be 'in the box'
 - e.g., strategy guides, websites, magazines...



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budget

- videogame budgets run well into the \$mil's
- serious game budgets small in comparison (\$100k's)
- serious game dev's can reduce costs via
 - collaboration (sharing resources)
 - technology (don't reinvent the wheel!)
- understand the money trail
 - all the case studies had external funding in some way (corporate, government)
 - how a game developer will be paid + the expected deliverables can differ significantly (incl. paperwork!)



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collaboration

- collaboration typical in serious game dev.
 - (e.g., each of the case studies was a collaboration b/w 2 or more parties)
- however, types of collaboration may vary significantly incl. role of game designer
 - from more or less autonomous in their own environment, to being more of a consultant and working within an external environment (e.g., University)



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technology

- developing tools, engines + content from scratch is expensive
- utilize middleware (e.g. Renderware)
- 'mod' existing game engines (e.g. UT, Neverwinter Nights...)
- chosen technology will depend on variety of factors
 - type of game being developed, target platform, personnel expertise...



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references

serious games

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www.educationarcade.org
www.virtual-u.org
www.vrphobia.com
www.etc.cmu.edu/projects/hazmat/

games

- www.agdc.com.au
- www.gamasutra.com
- www.qdconf.com



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