



summary

context: what are serious games and virtual worlds? How are they changing our social interactions and how we learn?

case studies from current research: triage trainer, ward off infection game, neurosky & physiological trainer

how does learning in traditional ways differ from learning in immersive environments?

examples of serious games: nanomission & floodsim

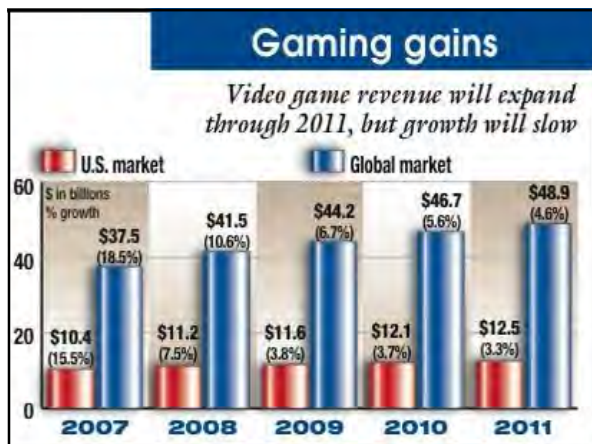
immersive experiences: changing how we understand human processes and creating new spaces

conclusions

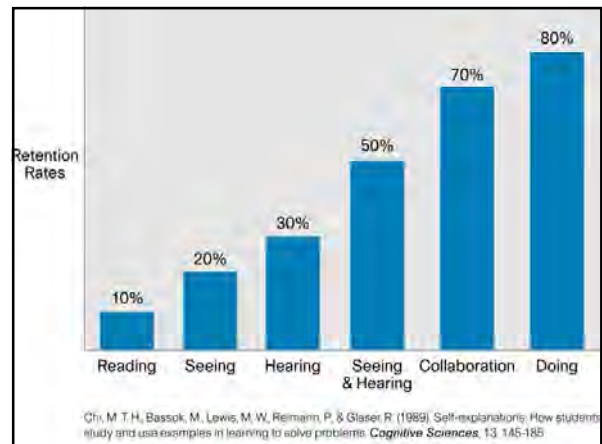
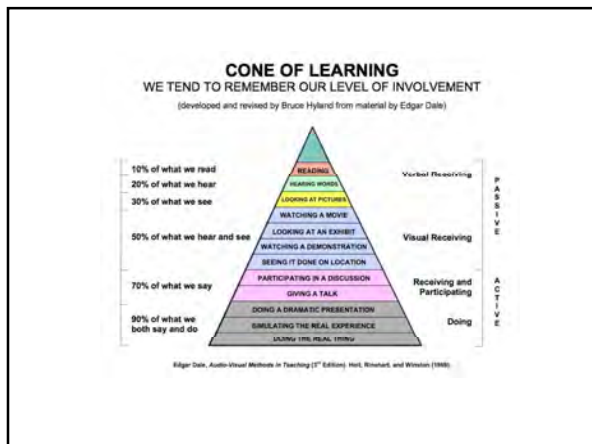
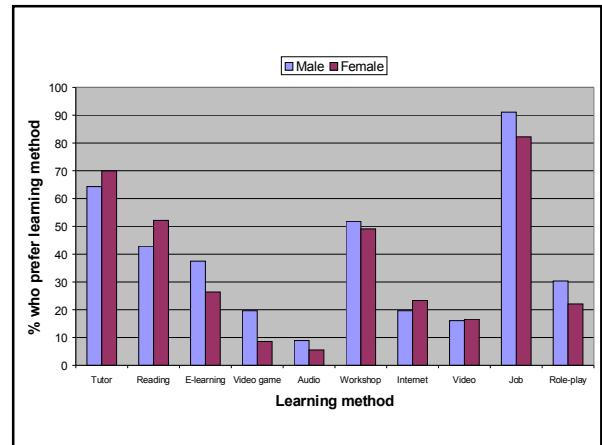
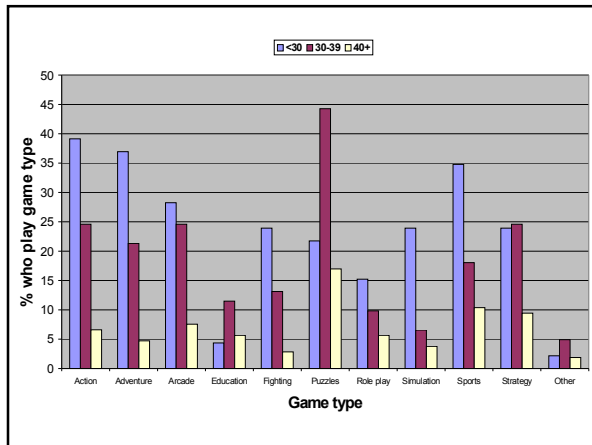
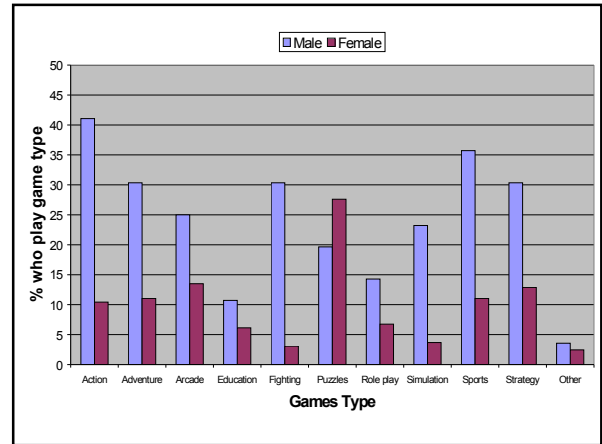
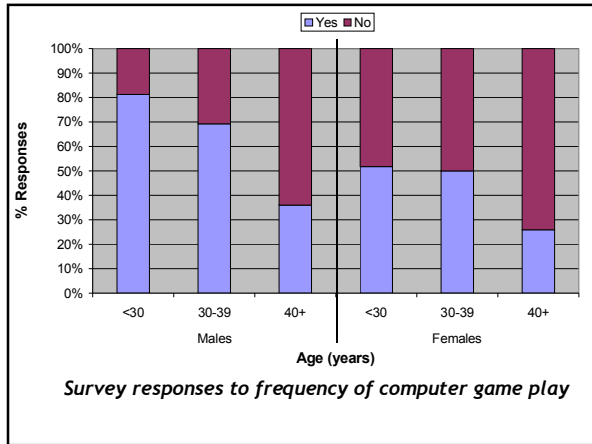
context for serious games & virtual worlds

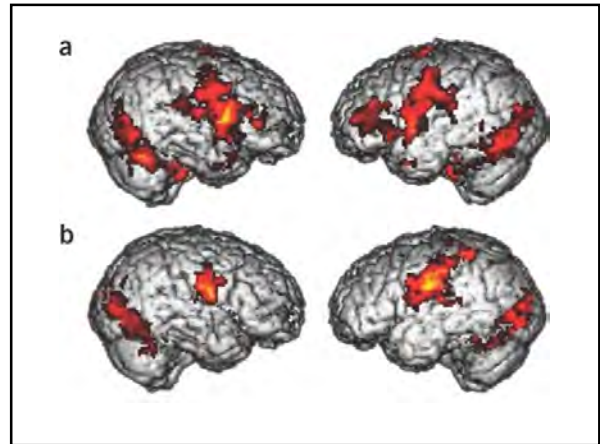
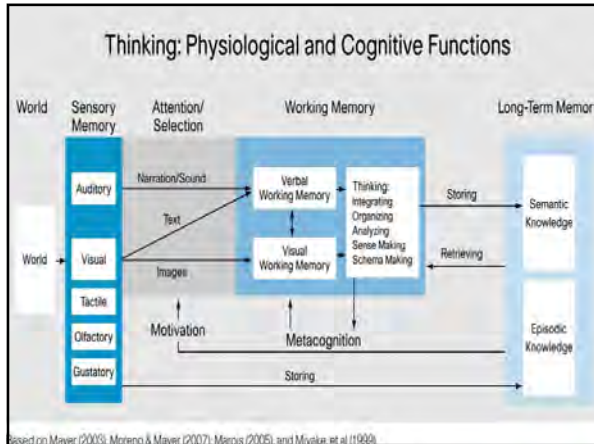
emerging trends

- by 2011 80% of all active internet users will have an avatar (gartner)
- currently 80 virtual worlds, by the end of this year another 100 (100+ aimed at young people)
- studies demonstrating the efficacy of serious games for training
- wide uptake of social software (e.g. facebook, wikipedia)
- lines between virtual worlds, games and social software blurring



case studies: infection control, neurosky triage trainer & physiological trainer games





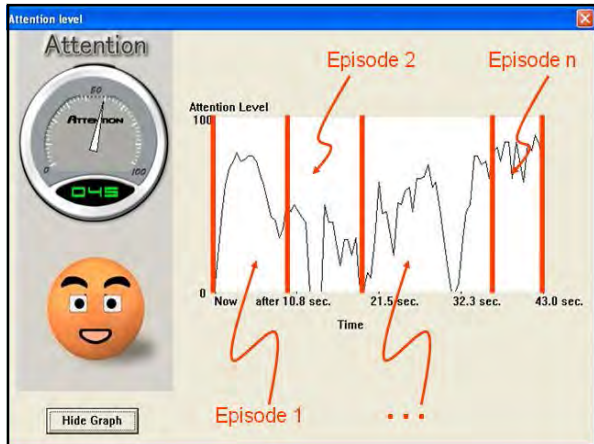
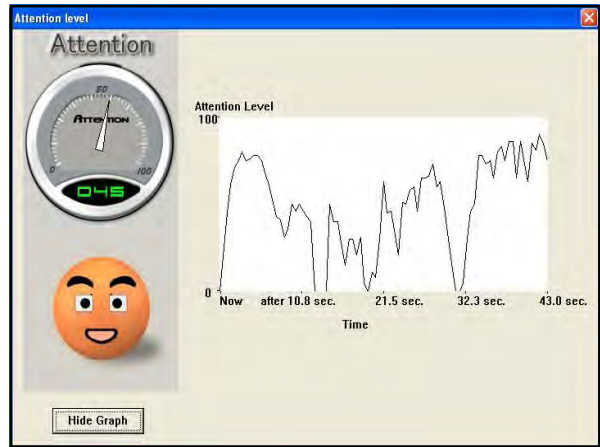
neurosky study

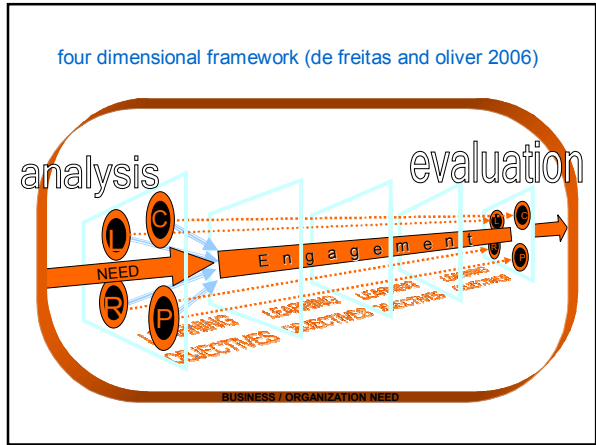
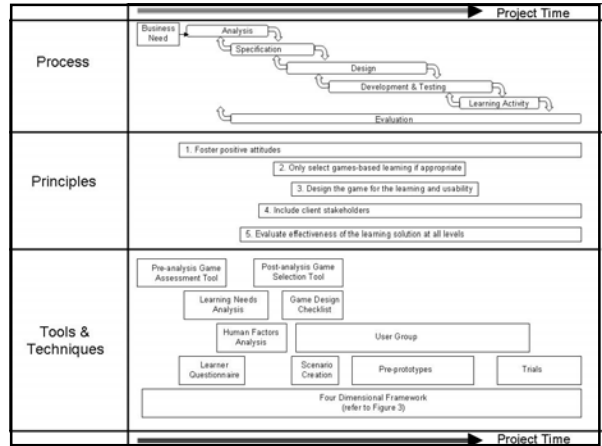
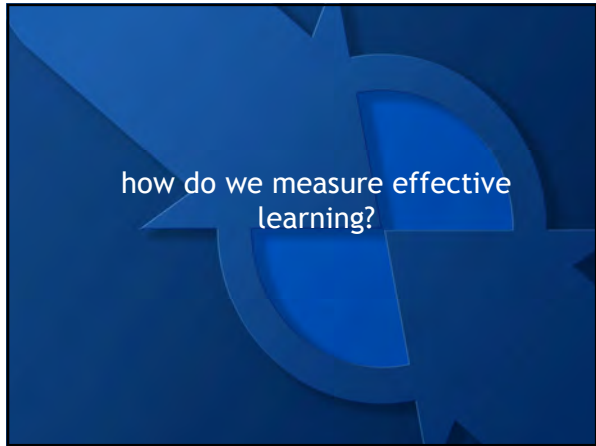
university of veracruz, mexico
 42 students
 18-20 year olds
 28 males and 12 females

test bci using interactions with ai-driven avatar in sl using assessment exercise

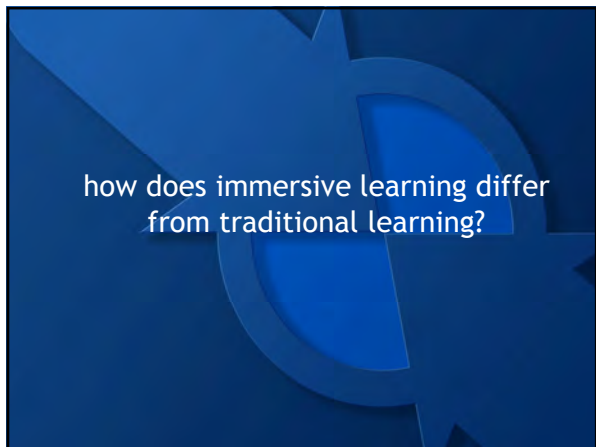
attention levels
 physiological level and data variables

ref: rebolledo-mendez & de freitas, 2008





Four Dimensional Framework	
Learner Specifics Profile Role Competencies	Pedagogy Associative Cognitive Social/Situative
Representation Fidelity Interactivity Immersion	Context Environment Access to learning Supporting resources



triage trainer - preliminary trial results

triage trainer (tt) trial summary:
5 trials: september 2007 – january 2008

independently conducted by the university of
birmingham

trial participants:
91 uk nhs doctors, nurses & paramedics
all on alsg major incident medical management
and support (mimms) training courses

participants were randomly distributed:
tt game (n = 47)
non-game (n = 44)

triage trainer - preliminary trial results

tt game group:
15 minute tutorial in game play / user interface
60 minutes playing the tt game on their own
instructor available to answer questions

non-game group:
75 minute normal alsg instructor-led table top
exercise
involved sorting cards with vital signs variables
written on them into priority groups

triage trainer - preliminary trial results

trial results of tt game trainees versus non-game trainees:

tagging accuracy of tt game trainees:
significantly higher accuracy [$\chi^2 = 13.126, p < 0.05$]

step accuracy of tt game trainees. comparing the ratios of
participants who achieved an 8/8

accuracy rating (i.e. followed the correct protocol for all 8
casualties):

significantly more accurate (28%) than the non-game
group (7%) [$\chi^2 = 7.29, p < 0.05$]

time taken by tt game trainees to complete triage of all 8
casualties:

no significant difference on time taken ($p > 0.05$)

triage trainer – preliminary trial results

possible conclusions:

A 'serious game' such as the Triage Trainer offers the
potential to:

- enhance learning; and
- improve transfer of training

possible reasons are that the game offers:

- opportunity to practice skills and knowledge gained on the
course in a more realistic and more engaging
environment

- personalised feedback which enables the game player to
correct procedural errors made, through repeated play

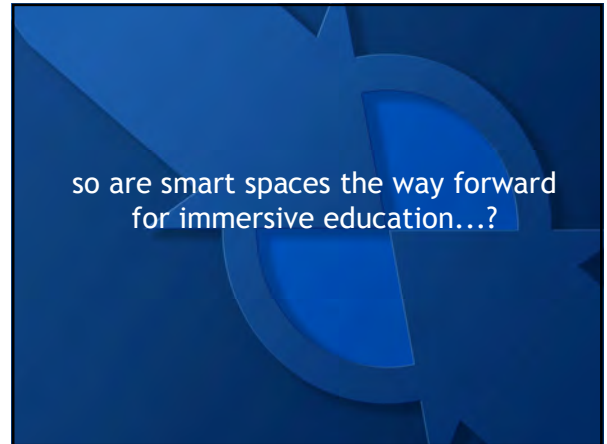


immersive experiences changing how
we understand our human processes

serious games for health





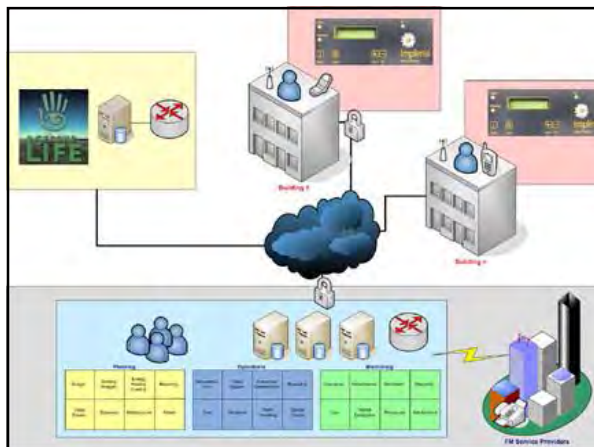


Sensor network

- Perceptual Information Infrastructure -

• Omnidirectional cameras, floor sensors, microphones and infrared motion detectors covers the whole laboratory.

• Tracking a person and recognizing behaviors with omnidirectional cameras.



Virtual Operations Center
Call Center Management

Energy & Load Management

Future Retail Center

Building Automation

Data Center Management

Fleet Management Logistics



sgi companies

physical tenants:

- Mircat
- Digital Presence
- Pixelearning
- Digital 2.0
- Ambient Performance
- CNUK UK
- Intelligent Commerce Extra
- Concept, Design, Virtualisation Ltd
- Cactus Films

virtual tenants include:

- TPLD
- PlayGen
- Breakaway Games Ltd
- Caspian Learning
- Walk in Web
- Warwick Multimedia
- See 3D
- Roll 7
- TwoFour Studios
- Blitz Games Studios
- Daden Ltd

sgi research questions

how can gbl learning be measured and evaluated?

- technology strategy board part-funded sg-ets project (trusim, selex)
- e-vita project (eu-funded project)

how can multimodal interfaces be best integrated and validated?

- rome reborn project (erasmus funding, university of virginia, toulouse university, daden)
- bci studies (imperial college, london; warwick university)
- games and visualisation techniques (warwick university)
- integrating artificial intelligence into games platforms (toulouse university)

sgi research questions - 2

how can standards and interoperability be developed to support wider uptake of games and virtual world content?

- meducator project (eu project)
- hefce employer engagement training toolkits

how can seamless experiences and dialogues be supported via smart and hybrid spaces?

- sgi location tracking project (cisco, giunti labs, ambient performance)
- virtual eden & living stories project (idm & erdf funded with eden project & playgen)
- building energy performance management system (eu funding, manchester city council, clicks and links)
- shaspa technology: connecting virtual and real spaces (shaspa, opensim)
- visualising urban centres (coventry & birmingham city visualisation projects, geosim, cdv city councils)

conclusions

so what is immersion and can it be tested and evaluated?

flow, feedback, visual and actual realism

great potential for the medium for supporting immersive education and changing how we understand the world

through increased motivation and engagement (immediate feedback, immersive environments)

need for more empirical evidence

studies being undertaken to validate efficacy of using serious games

need to develop the community to support leading edge research and development in the field

collaborative research and development

links:

new jisc report on serious virtual worlds:
<http://www.jisc.ac.uk/publications/publications/seriousvirtualworldsreport>

second wednesday events resume in the summer 2009

serious games institute web site, see:
www.seriousgames.org.uk

any questions contact: prof. sara de Freitas
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recent references

de Freitas, S., Jarvis, S. (2008). Towards a development approach for serious games. In T.M. Connolly, M. Stansfield, & E. Boyle (Eds) Games-based learning advancements for multi-sensory human-computer interfaces: Techniques and effective practices. IGI Global, Hershey, PA.

Rebolledo-Mendez, G., de Freitas, S. (2008) Attention modeling using inputs from a Brain Computer Interface and user-generated data in Second Life. In Proc. of the Workshop of Affective Interaction in Natural Environments (AFFINE) 2008. In association with ACM Tenth International Conference on Multimodal Interfaces (ICMI), Crete, Greece.

de Freitas, S., Rebolledo-Mendez, G., Liarakis, F., Magoulas, G., Poulouvassilis, A. (2009) 'Developing an evaluation methodology for immersive learning experiences in a virtual world'. In Rebolledo-Mendez, G., Liarakis, F., de Freitas, S. (Eds) Proceedings of 2009 Conference in Games and Virtual Worlds for Serious Applications, IEEE pp 43-50.

Jarvis, S., de Freitas, S. (2009). Evaluation of a Serious Game to support Triage Training: In-game Feedback and its effect on Learning Transfer. Proceedings of 2009 Conference in Games and Virtual Worlds for Serious Applications, IEEE