the power of immersive experiences: using serious games and virtual worlds to enrich social interactions and create new spaces

SGI Serious Games Institute

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)

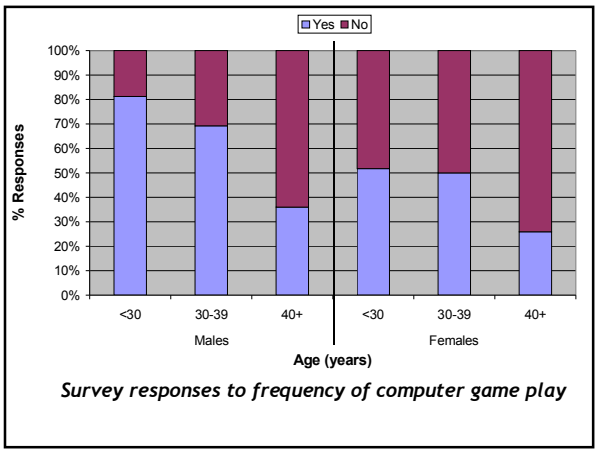
studies demonstrating the efficacy of serious games for training

wide uptake of social software (e.g. facebook, wikipedia)

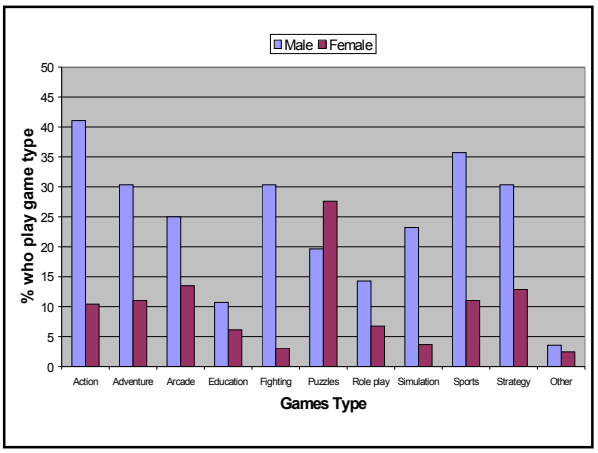
lines between virtual worlds, games and social software blurring

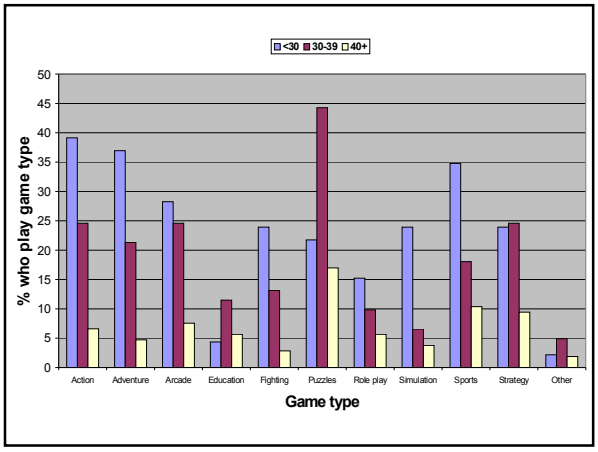
case studies:

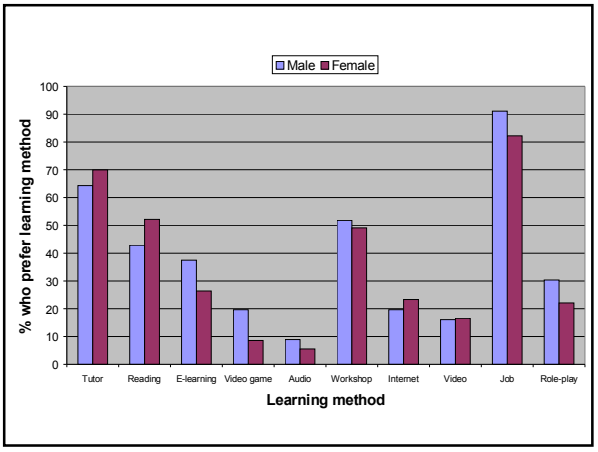
infection control, neurosky triage trainer & physiological trainer games

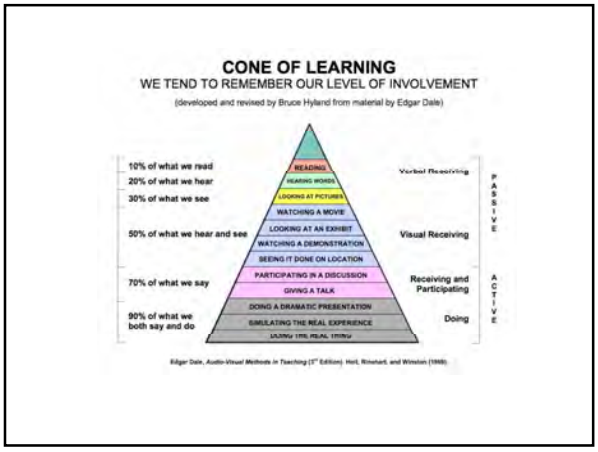


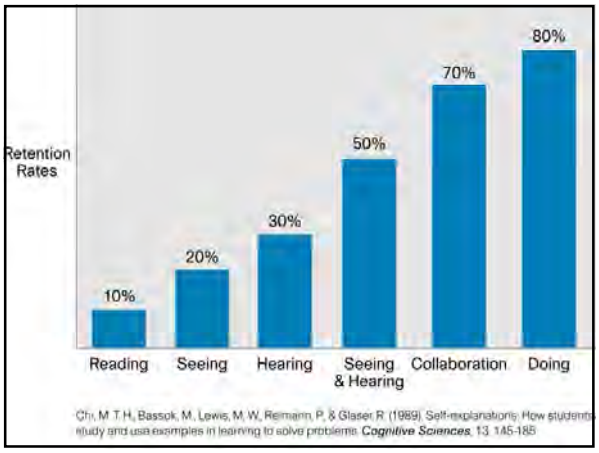
Survey responses to frequency of computer game play











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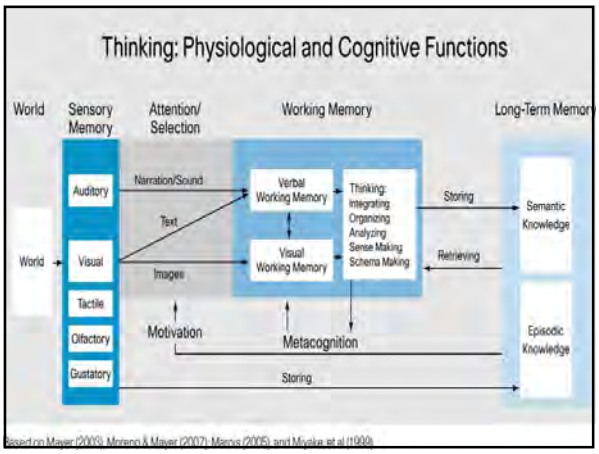
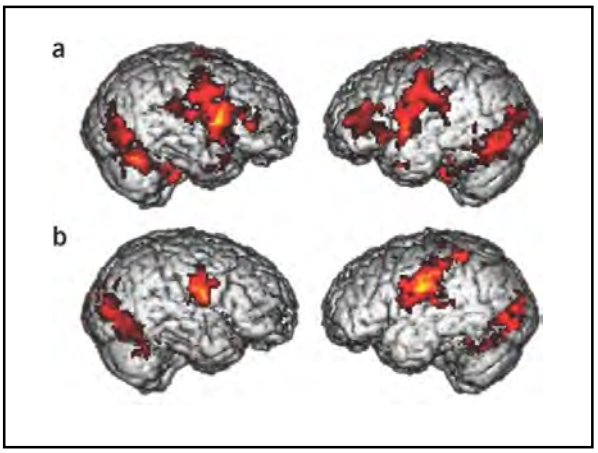




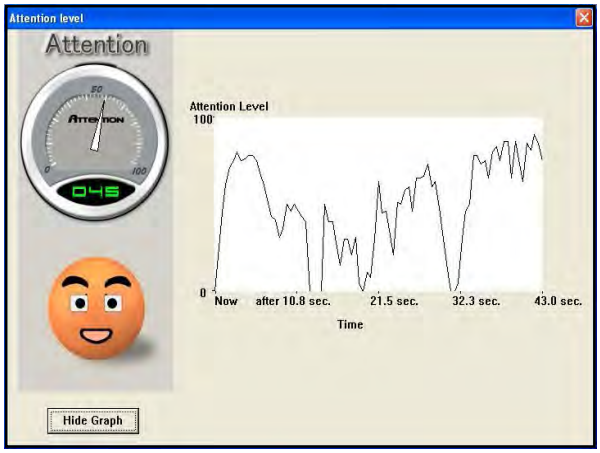
neurosky study

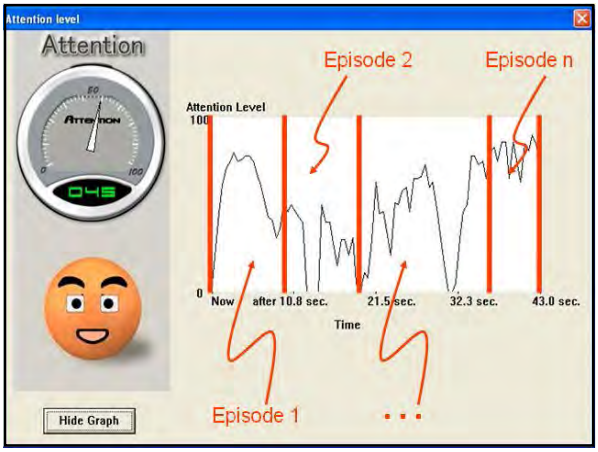
university of veracruz, mexico
- 42 students
- 18-20 year olds
- 28 males and 12 females

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

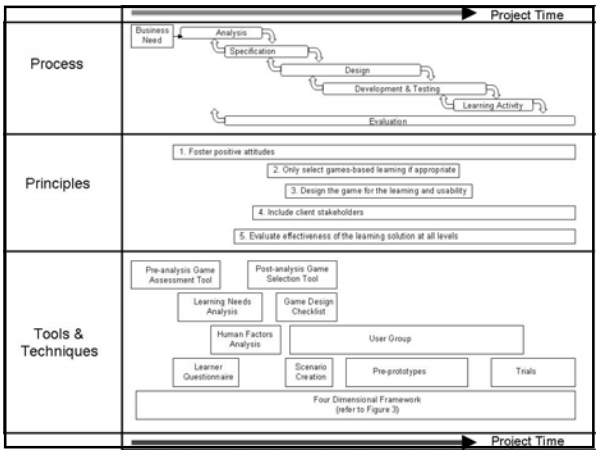
attention levels
- physiological level and data variables

ref: rebolledo-mendez & de freitas, 2008

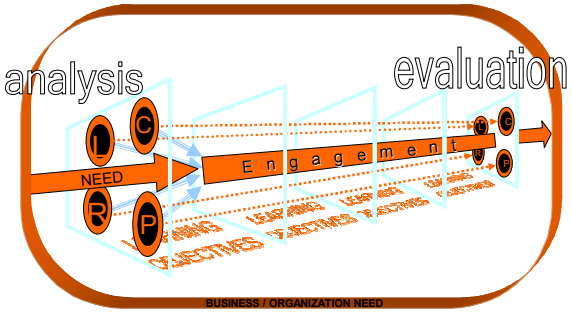




how do we measure effective learning?



four dimensional framework (de freitas and oliver 2006)



Four Dimensional Framework

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

how does immersive learning differ from traditional learning?

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
SKIP
Jacob has lung cancer! We need your help to create nanomedicine to cure hi

HEALTH
CANCER
SKIP
THE LUNGS
EXIT
When inhaling, air enters through the trachea and moves through the bronchi which branch to form a network of bronchioles.

HEALTH
CANCER
SKIP
THE ALVEOLI
EXIT
From here you can see an isolated alveoli and the cancer infecting it. Select a cell and take

CANCER
THE CELL
EXIT
Receptors are found on all cells and only allow molecules with the corresponding key/ligand to attach to them. Your vesicles will need to have the correct keys that

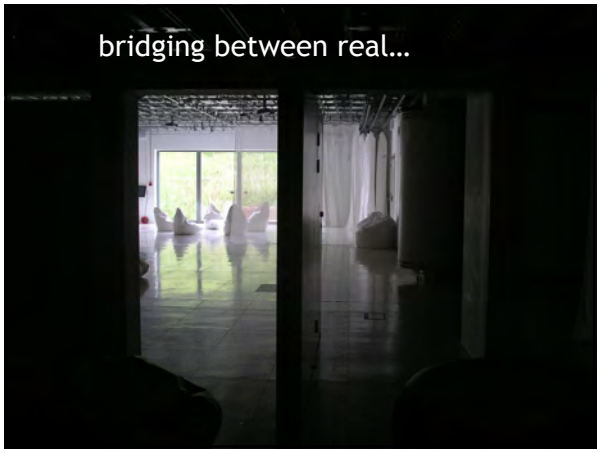
TRAILER
DESCRIPTION
CHARACTERS
MISSIONS
AN EPIC BATTLE RAGES DEEP IN THE REALMS OF THE HUMAN BODY.
AN EPIC BATTLE RAGES DEEP IN THE REALMS OF THE HUMAN BODY. COLONIES OF MICROSCOPIC CANCER CELLS REPLICATE, ATTACK AND DAMAGE HEALTHY ORGANS. ENTER ROXXI, YOUR GUTSY AND FULLY ARMED NANOBOT, AND MEDICINE'S MIGHTIEST WARRIOR. LEAD HER THROUGH CHALLENGING MISSIONS AND RAPID-FIRE ASSAULTS ON MALIGNANT CELLS, WHEREVER THEY HIDE. IT'S THE WORLD'S SMALLEST BATTLEFIELD, YET THE STAKES HAVE NEVER BEEN HIGHER.
DOWNLOAD OR ORDER THE GAME NOW!

About
Help
Quit
Credits
Petition
Send To a Friend
Year 1
South East England
Population
Economy
Flood Risk
Policies
Flood Defence Budget
Hello, I am your Advisor, here you can see several main areas of interest...

changing the physical world

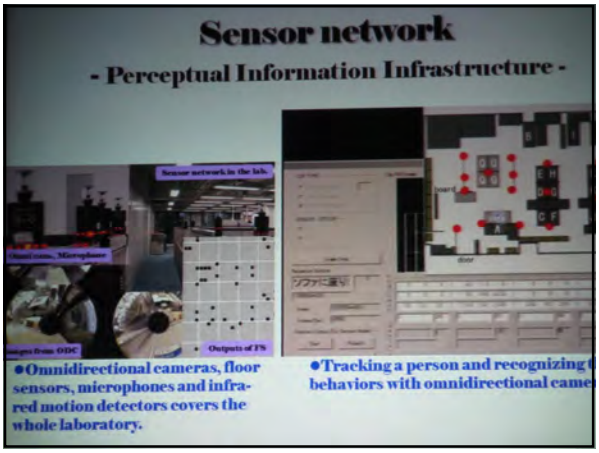
...and how we design the virtual world

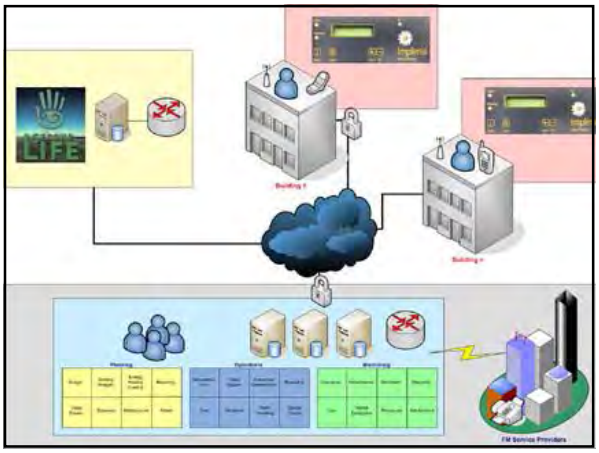
and even how we think about out planet


bridging between real...

hybrid spaces...

so are smart spaces the way forward for immersive education...?





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

SGI Serious Games Institute

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 s.defreitas@coventry.ac.uk

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.

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