

What can gamification add to cultural heritage?



Summary: Towards a new immersive Cultural Heritage experience

- 1) Serious Games Institute: hybrid model bringing together industry and academia.** How we are addressing critical challenges in our research and development work, including trajectories for research work and some key findings and research challenges (www.seriousgames.org,uk)
- 2) Due to globalization challenges and economic downturn we are at a transformative moment in culture and cultural heritage,** e.g. cuts to national and regional budgets. How can we address this? What is the role of 'gamification', play and feedback in this new cultural interchange between globalised cultures. What are the impacts upon in social (behavioural) change and awareness raising in cultural heritage?
- 3) Case Studies: Shakespeare Trust Project, Priory Undercrofts and Roma Nova**
- 4) Reflection upon creating cultural heritage experiences?** What role for gamification and games?

Corporate Overview: Coventry University

- Coventry University was voted Entrepreneurial University of the Year in 2011 (THES)
- The university has four faculties and three institutes and has over 19,000 students
- We are a top 1992 university and have a strong reputation in applied research and business engagement
- Coventry University Enterprises Ltd is the commercial arm of the university and has established over 200 SMEs
- Coventry university undertook 25% of all industrial consultation undertaken by British universities



1: Serious Games Institute: Part of the Game Science Group: bringing together commercial and research expertise



Serious Games Institute: An International Hub of Excellence in Serious Games Research, Business and Study



The Serious Games Institute – Hybrid model

- **Business:** 4 spin outs, serious games studios, mobile apps lab
- **Applied Research:** 23 projects, 11 EU projects
- **Study:** Masters programme, Doctoral School, CPD, Bespoke training solutions

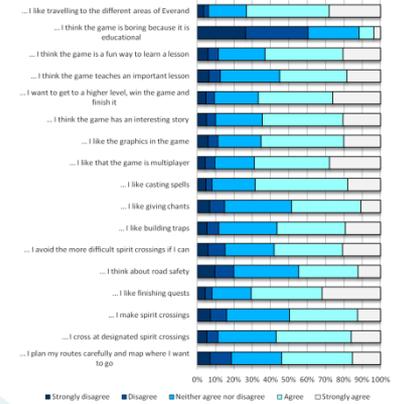


The Serious Games Institute – Applied Research



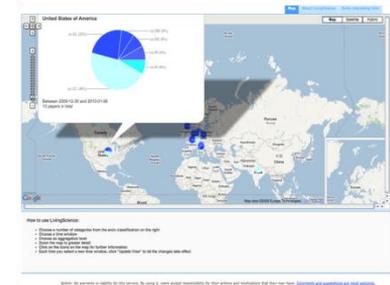
Applied research projects (23 projects, 12 EU projects)

IEEE VS-Games conference (2008-2014)



Second Wednesday events (2008-2014)

Consultancy work



The Serious Games Institute – Study



Masters Programme

**Doctoral School
(industry funded PhDs)**



**CPD /
Advantage+
modules**

**Internship programme
(access to
developers and
modellers)**



Projects & Games at the Serious Games Institute

Erasmus: Roma Nova

Undercrofts Priory

Coventry City Council: Far Gosford Street Reconstruction

Technology Strategy Board: Shakespeare Trust

FET FuturICT

JISC Customer

JISC Inspires

JISC OpEx Platform

UK Department for Transport Code of Everand

EU Strep Masetov

EU Strep ALICE

EU GALA Network of Excellence in Serious Games

EU IP mEducator

CIP Inspiring Science

EPSRC Servitisation

EPSRC BuildTEDDI

LLP EduGameLab

LLP SimAULA

IP PEGASO

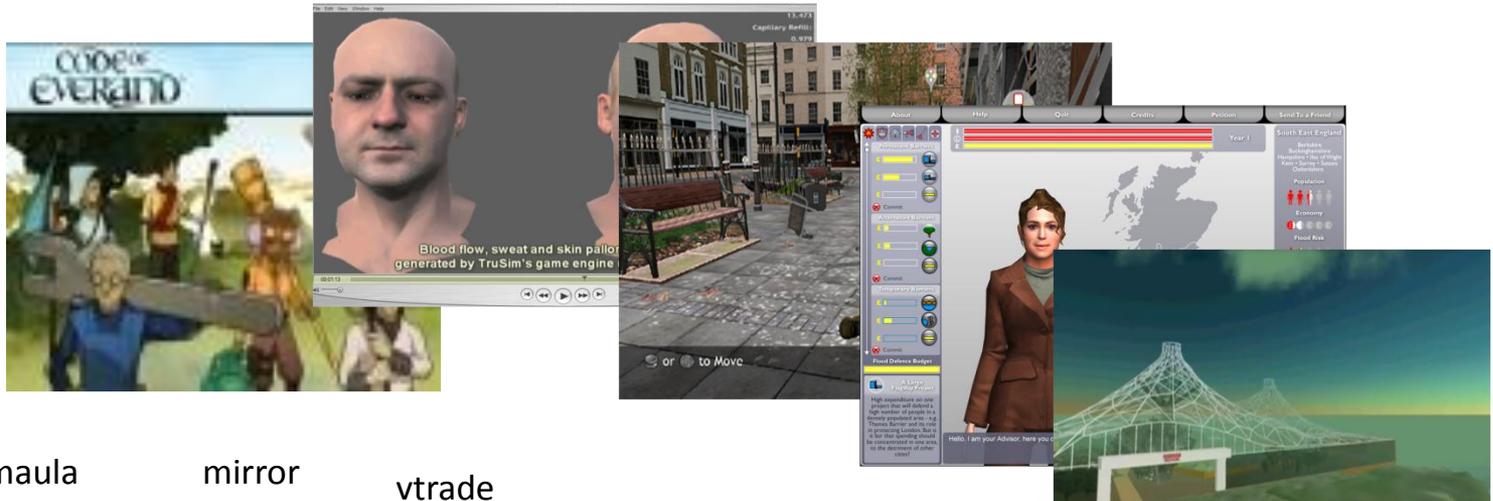


Examples of Games at the Serious Games Institute

meducator

alice

code of everand



roma
nova
gala

simaula

mirror

vtrade

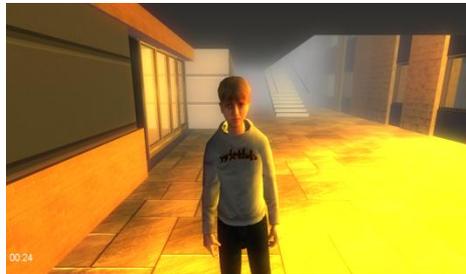
floodsim

customer

futurict



modes



edugamelab

masetov



prepare



2: Towards a new immersive cultural heritage experience: access, re-use, transformation and reconstruction

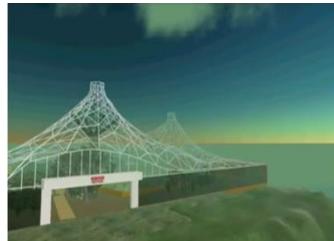


Definitions and scope

• What is a cultural heritage experience?

• What is gamification – and how can it support cultural heritage?

• What are the differences in structured and free play?



Trends in Games and Gamification

What is new?

e-Learning:

Advances in e-learning uptake internationally: online learning, MOOCs, learning analytics.

Pervasive game play:

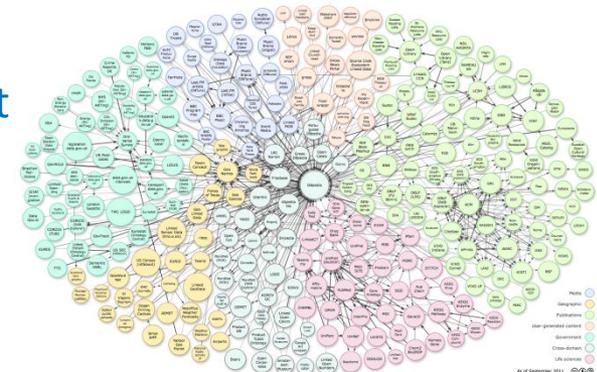
International Software Federation of Europe (isfe, 2010): 74% of those aged 16-19 considered themselves gamers (n=3000), 60% of those 20-24, 56% 25-29 and 38% 30-44. E.g. 32% of the total uk population consider themselves gamers (n=3000). 31% of females described themselves as gamers and 34% of males.

Serious game play:

Value of SG in 2010 was estimated to be \$1.5 billion, and is set to increase by average 47% between 2010 and 2015 (i-date market report).

Open data, metadata and data:

New extending role of open and big data, allows us to personalize experiences in a dynamic and immediate way.



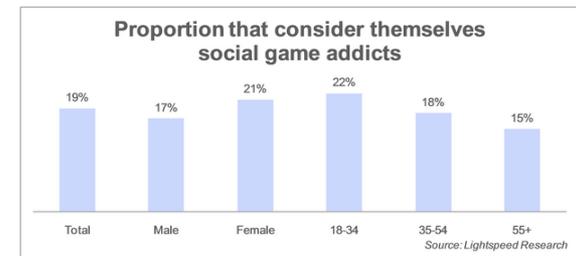
Key highlights from the research

What is new?

Efficacy of game-based approaches over traditional learning: *Triage Trainer* pragmatic controlled trial showed effectiveness of games over traditional learning in two of the three measures (Knight et al., 2010). *Prepare* cluster randomised control trial showed (Arnab et al., forthcoming). *Code of Everand* evaluation study showed game played for 30 minutes on average and high engagement of players.

Importance of play: Link between less free play and higher anxiety in children (Chudacott)

Social interaction: collective awareness platforms, social software uptake and emphasis upon peer learning, use of mobile devices, augmented reality



Key Themes in Cultural Heritage

Due to reducing national budgets, digitization and raising expectations of visitors, we can use new technologies to improve the visitor's experience:

- a) **Visualization and modelling** to aid with reconstruction of old ruins and remains to enhance the visitor's experience (Priory Undercrofts project).
- b) **Digitization of records** to enliven and deepen the experience (BT archives project)
- c) **Re-Use and Open Access** of digital records to reach wider audiences and those unable to visit in person (mEducator project)
- d) **Reconstruction used for scientific research purposes:** to learn how buildings were used in different periods (Priory Undercrofts project)
- e) **Transformation of content** and materials through reuse and co-creation

3: Case studies



**Shakespeare
Trust**



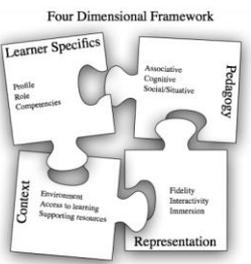
**Priory
Undercrofts**



Roma Nova



Mapping our systems more closely against human behaviour



design

theory

a: neuro-psychology approaches to learning with games

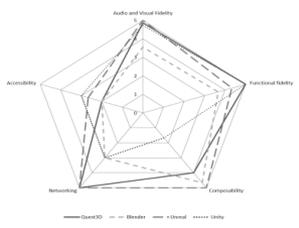
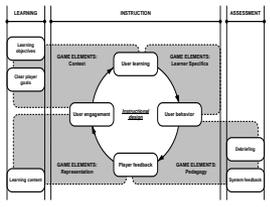
b: visualization and modelling

c: multimodal interfaces

d: artificial intelligence and life



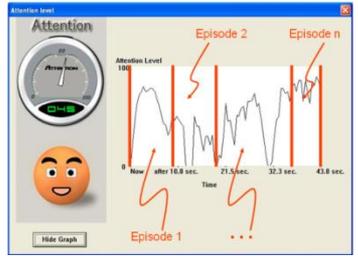
interactive tutoring environment & a new learning



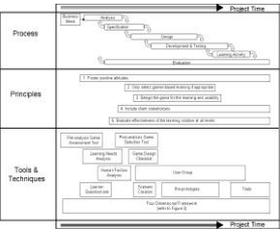
interactivity

e: semantic web, standards and metadata

feedback

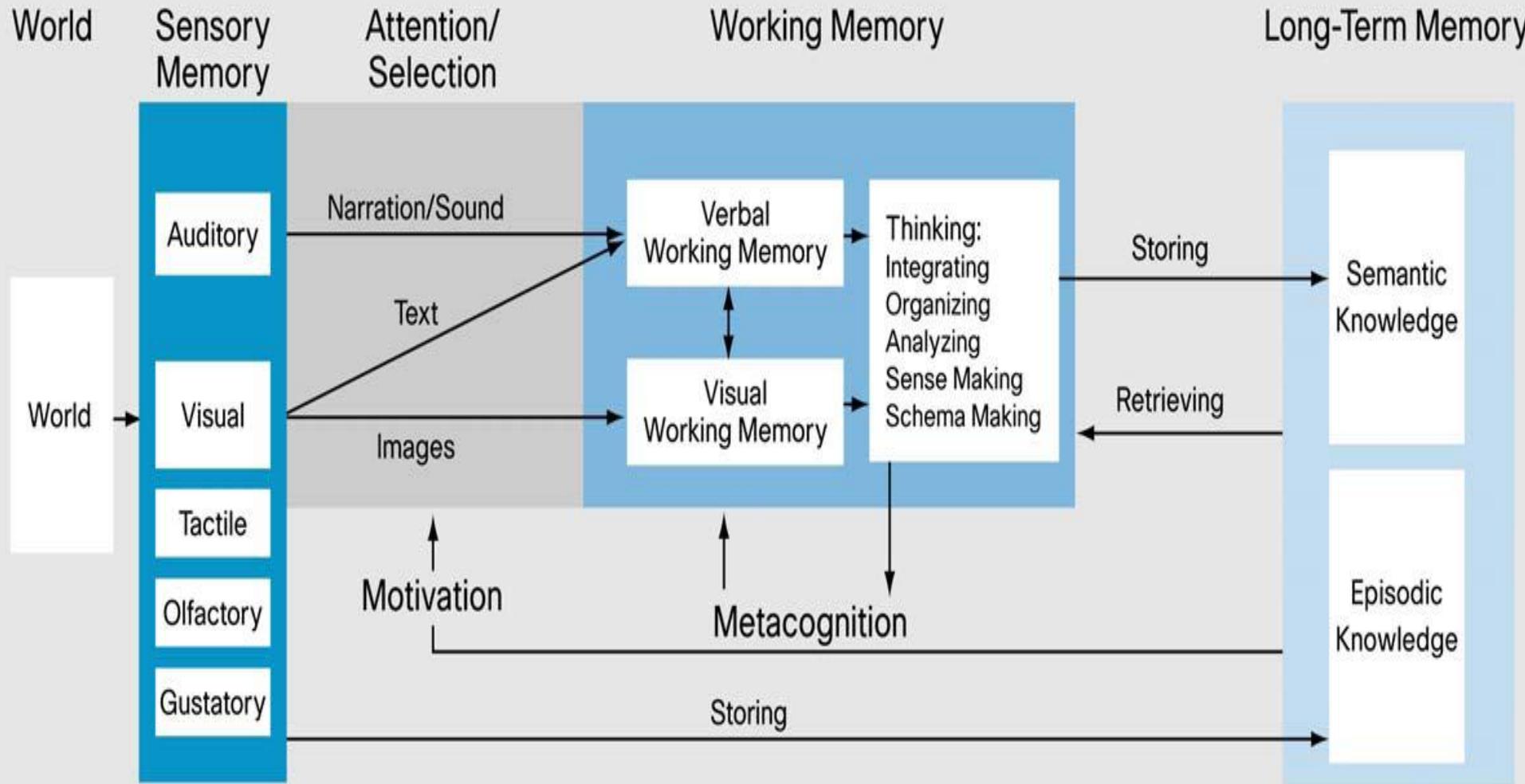


adaptivity



models and frameworks
2006-2013

Thinking: Physiological and Cognitive Functions



Shakespeare Trust project: Enlivening the Visitor's Experience



Priory Undercrofts: Bringing the Past to Life



Roma Nova: A Cross-Curriculum Learning Experience



Roma Nova: Big Data and Semantic Web Mashups



Roma Nova: Scaffolding the Learners Experience in-game



4: Reflections and conclusions

So, why are games and gamification approaches so powerful?

Scalability of game environments: extending reach to large global communities

Greater scope for creating immersive experiences: providing new tools for flow, feedback, visual and actual realism leading to higher levels of immersion

Improved user engagement and adaptivity to user requirements: there is **scope for learning more** by closer modelling of user behaviour (feedback loop) there is increased motivation and engagement, potential for personalized feedback and more sophisticated learning interaction

Strong scientific evidence of behavioural change: ability to feel more like you are back there and change behaviour and attitudes as a result

move towards immersive learning experiences and design: with increased motivation, immediate feedback and sophisticated user models

So, what can gamification add to cultural heritage?

Gamification and games-based approaches can:

Create an **immersive experience** to enhance the visitor's experience

Connect up education and culture through missions and quests

Open up access and transformation to more cultural collections and content

Create **new opportunities for scientific research...**



Events & Books

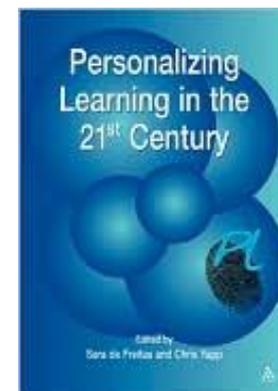
Book now for upcoming events:

New season of Second Wednesday events starts in September 2013...

Join us at:

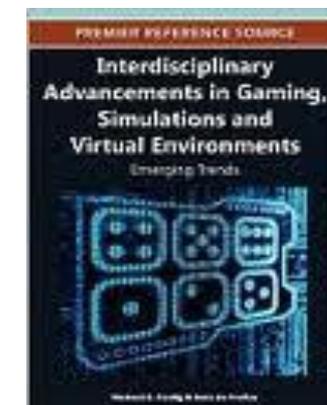
**IEEE VS Games conference:
Bournemouth, UK**

11th-13th September 2013



RETHINKING
LEARNING FOR A
DIGITAL AGE
HOW LEARNERS ARE SHARING THEIR
OWN EXPERIENCES

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selected references

JOURNAL ARTICLES & CONFERENCE PAPERS:

Anderson, E.F., McLoughlin, L., Liarokapis, F., Peters, C., Petridis, P., de Freitas, S. Serious Games in Cultural Heritage, 10th VAST International Symposium on Virtual Reality, Archaeology and Cultural Heritage (VAST '09), VAST-STAR, Short and Project Proceedings, Eurographics, Malta, 22-25 September, 29-48, (2009).

de Freitas, S., Rebolledo-Mendez, G., Liarokapis, F., Magoulas, G., Poulouvassilis A. (2010). Learning as immersive experiences: using the four dimensional framework for designing and evaluating immersive learning experiences in a virtual world. *British Journal of Educational Technology*

Dunwell, I., Petridis, P., Protopsaltis, A., de Freitas, S., Panzoli, D. & Samuels, P. Automating Content Generation for Large-Scale Virtual Learning Environments using Semantic Web Services. In proceedings of the 5th International Workshop on Semantic Wikis (SemWiki2010), ESWC2010, Hersonissos, Crete, Greece, May 29th -June 3rd 2010

BOOKS (2010-2013):

Sharpe, R., Beetham, H. & de Freitas, S. (Eds) (2010) *Rethinking Learning in the Digital Age*, London & New York: Routledge.

de Freitas, S. & Maharg, P. (Eds) (2011) *Digital Games and Learning*. London and New York: Continuum Press

de Freitas, S & Jameson, J. (2012) *The e-Learning Reader*. London & New York: Routledge.

Ferdig, R & de Freitas, S. (eds.) (2012) *Interdisciplinary Advancements in Gaming, Simulations and Virtual Environments: Emerging Trends*, Hersey, PA, IGI Global.

Forthcoming: de Freitas, S. (2013) *Education in Computer Generated Environments*. London & New York: Routledge

BOOK SERIES:

de Freitas, S. & Maharg, P. (Series Eds) (2011-) *Digital Games and Learning*. London and New York: Routledge.



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