



# Digital Natives, Virtual Worlds, Mobile Technologies and Games

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# Ongoing Projects

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- Digital Natives at School (Data collected)
- Digital Games for Tertiary (Ongoing)
- Deconstructing Computer Games (Data collected)
- Mobile Phones in Lectures (Data collected)
- Education and Virtual Worlds (Ongoing)
- Cognitive Style Analysis Reliability Project (Ongoing)
- Year 7 and 8 Literacy project (Ongoing)
- Unplugged (Data collected)



# Digital Natives at School

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- Background

- Digital Natives have altered the way they process information in a manner distinct from preceding generations.
- Researchers suggest that differences detected in thinking patterns exhibited by Digital Natives can be attributed not only to the emerging socio-cultural environments, but also to neurological changes detectable in the structure of the brains of these Digital Natives (Prensky, 2001; Greenfield, 1984)
- studies suggest that changes in the wiring of the brain occur only when a significant amount of time is spent using the technology (Bauer, 1999; Prensky, 2001a)



# Digital Natives at School

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- Aims

- Do children who are immersed in Technology show different learning behaviours compared to those not immersed
- Do children immersed in Technology show differences in attention and reasoning skills compared to those not immersed



# Methods

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- Questionnaire
  - Asking children about their use of technology
    - 224 children age 10-11yrs
    - Immersion Score calculated
- Reasoning and Attention Tests
  - 92 children (47 low, 45 high)
    - d2 test of attention (Brickenkamp & Zillmer, 2003)
    - Reasoning skills test (CEM Centre, 2005)



# Methods

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- 48 children (24 high, 24 low)
  - Research task
    - Asked to research a particular era in history using the resources in the room: books, writing materials, computer with internet and printer
      - Children's work
      - Video taped behaviours and observers notes
      - Asked to narrate their thoughts as they did it
        - How do they approach the task?
        - How do they manage the task?
        - What resources do they use?
        - How do they perform?



# Methods

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- Internet task
  - Asked specifically to use the internet to research and solve a problem
    - Children's work
    - Screen capture
      - How do they carry out the task?
      - How efficient at internet searches are they?
      - How do they translate and record the information?



# Methods

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- Computer Game
  - Play a short flash learning game
    - Key presses recorded in log file + screen image
      - How do they navigate the game?
      - What strategies do they use?
      - How do they play the game e.g. do they use the tools available?
      - How good are they?





# Digital Games for Tertiary

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- 1<sup>st</sup> year University BA course and 3yr study (N=75):
  - 'Computer Games and Education'
- Course structure (year 1):
  - 1 term 'Intro to education' material (x12 1hr lectures)
    - Mid semester exam
  - 1 term 'intro to computer game theory' material (x6 1hr lectures)
  - training on how to build computer game modules using the NWN toolset (x12 2hr workshops)
    - Assessed exercises after each session
    - Major assignment – build a module that teaches one of the topics covered in the education lectures



# Research

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- Year 2 and 3
  - Traditional lectures transformed into computer game modules
    - Half in year 2
    - All in year 3



# Methods

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- Direct comparison of exam (blind marked)
- Experience Sampling Method (ESM)
  - 1 per lecture (randomly administered)
  - 2 per lab
- General questionnaire about themselves, approaches to learning and use of technology



# Aims

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- Do students learn better from a games experience compared to the traditional approach?
- What is the students experience during lectures, workshops and learning through games?
- How do students motivations change over these differing experiences?
- How does experience relate to learning outcome?



# Deconstruction Computer Games

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- Just at the pilot stage:
  - How do different game variables affect player experience?
  - How can we successfully incorporate learning into game play?
  - How do game variable affect learning within a game?
  - Can we manipulate game experience to aid learning?



# Early Methods

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- Different game modules built using NWN toolset
- Vary 1 aspect of the game e.g. Goal
  - Measure experience
  - Measure learning
- So far we have a 3 identical games that vary according to how goal directed they are from no goals to very goal directed
  - Independent groups design
  - Game experience questionnaire
  - Incidental learning questions



# Mobile Phones in Lectures

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- We want to increase the communication and interaction in large lecture classes
  - Laptop – Datacard
  - Students encouraged to text in any questions they have during a session (or outside of lecture time)
  - Tried it last year (will try again this year)
    - Sent out questionnaire to students who participated (50 responses)



# Some preliminary results

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- Generally students thought it was good as long as it didn't disrupt the flow of the lecture
  - Enabled students to ask questions that they may not normally ask due to being self conscious
  - Enabled students to clarify things immediately
  - Would have preferred it if it was free (or same network)





# Education and Virtual Worlds

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- Just starting on a project where the goals are to:
  - Evaluate and examine the state of the art in 3D virtual environments (e.g. second Life, Active Worlds, Open Croquet) and their application in education
  - Implement several sample educational scenarios in an appropriate 3DVE for demonstration
  - Educate interested university staff in the use and deployment of 3DVEs, their potential for education, and the use of content authoring for creating lessons.



# Deliverables

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- A set of tutorials aimed at teaching university staff to create content in virtual environments that can be used to construct educational scenarios. To be delivered via a seminar and accompanying workshops.
- A report detailing the likely educational merits of this approach, along with sample scenarios, a review of other work in the field, and notes on the applicability of this work to different disciplines.
- A small set of sample scenarios intended to demonstrate key elements of this approach.