Creating opportunities for multimodal layered learning through Augmented Reality
WHAT IS ARSTUDIO?

ARstudio is an Australian Government funded innovation and development project to identify effective uses of augmented reality in an educational context, together with tools for mapping its uptake and evaluating its effectiveness. This includes producing a collection of practice models, illustrating interactive, pedagogically-driven uses of augmented reality in common learning spaces.

- **ARstudio** - practice, skills, accessibility
- **ARchive** - case studies, models, guidelines, evaluation & frameworks
- **ARcamp** - community, sharing, ideation
“A collaborative environment to focus expertise, develop practice, provide resources and build capacity for effective implementation of AR technologies in education”
AR DEFINITIONS

“real-time views of a physical, real-world environment whose elements have been augmented, enhanced or enriched by computer-generated sensory input, such as sound or graphics.”

(Azuma, R. 1997)

“Augmented reality (AR) is a live, direct or indirect, view of a physical, real-world environment whose elements are augmented by computer-generated sensory input such as sound, video, graphics or GPS data.”

(Wikipedia, 2012)
WHAT IS AR

- GE’s Augmented Reality, Popular Science Magazine (Jun 2009)
- 1st interactive 3D magazine
- Fiducial markers
- Flash & ARToolkit

http://www.youtube.com/watch?v=5fGav7Fl5P4
WHY AR? WHY NOW?

- **Horizon Report 2009**
  - Mobiles
  - Cloud computing
  - Geo-everything
  - The personal web
  - Semantic-aware computing
  - Smart objects

- **Horizon Report 2010**
  - Mobile Computing
  - Open content
  - Electronic books
  - Simple augmented reality
  - Gesture based computing
  - Visual data analysis

- **Horizon report 2011**
  - Electronic Books
  - Mobiles
  - Augmented Reality
  - Game Based Learning
  - Gesture based computing
  - Learning analytics

- **Horizon report 2012**
  - Mobile Apps
  - Tablet Computing
  - Game based learning
  - Learning Analytics
  - Gesture based learning
  - Internet of things
GOOGLE TRENDS

Augmented Reality 2004-12
where the term ‘AR’ or ‘Augmented Reality’ appear in trackName or description

n=2057

Apps by release date on iTunes store

(Krix, P 2012) accessed 24/08/12
Apps per genre (primary)

where the term ‘AR’ or ‘Augmented Reality’ appear in trackName or description
n=2057

Apps ordered by genre on iTunes store
(Krix, P 2012) from iTunes store accessed 24/08/12
OPPORTUNITIES

'AR offers opportunities to expand our concept of learning spaces, to create new dimensions in mobile learning and to increase connectedness of learners in multiple contexts'

‘learning can occur at a deeper level when pedagogy and content knowledge exist in context.'
Miniaturisation
Mobile Evolution by Kyle Dean

Massification
Nokia timeline, (legacy map)
(Sutherland, I. 1968) A head-mounted three dimensional display. pg 757-764

(Helig, M. 1962) The Sensorama, from U.S. Patent #3050870
Claude Glass, 1778
‘the view could sell for 1000 pounds...if only one could fix the image!’
Thomas Gray (poet)

Camera Obsccura,
Aristotle to Daguerre, 384BC-1826
User experience of AR

**INTIMATE**
- Whole body/upper torso in FOV
- Fewer spectators
- Wider distribution

**PERSONAL**
- Only extremities or head in FOV
- 1-2 Participants
- Wide distribution & locations

**PRIVATE**
- Only extremities in FOV
- 1 Participant
- Currently almost zero installed base

**PUBLIC**
- Whole body in FOV
- More spectators
- Limited distribution
PERSONAL

• MOMA NYC
  Art Hijack
• 9th Oct 2010
• Geolocated
• Flash & ARToolkit

http://www.youtube.com/watch?v=b9T2LVM7ynM
PUBLIC

• NSW Australia Tourism, Jul 2012

• Fiducial marker & Kinect

http://www.youtube.com/watch?v=UjW-CGjG8kE
Google glass project, April 2012
http://www.youtube.com/watch?v=9c6W4CCU9M4
Live demo

**ARstudio** - Anna’s story & prospectus, (theme:narrate)

**SkyView & Transparent Earth, Plane Finder** (theme: inform, reveal)

**Theodolite** (theme: reveal, simulate)

**Londinium** (theme: reveal)

**OTHER APPS**

Aurasma
AR studio
String
Spacecraft 3D
Toyota 86
Defend the earth
AR Basketball
Transparent Earth
Londinium
Plane Finder AR
Skinvaders
Theodolite ($)
Magic Plan
Wikitude
Google
Junaio
'AR offers opportunities to expand our concept of learning spaces, to create new dimensions in mobile learning and to increase connectedness of learners in multiple contexts.'

‘learning can occur at a deeper level when pedagogy and content knowledge exist in context.'
**Mini Design Challenge**

**Flipped research, innovation and development**

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**Step 1**

**Discovery**

**Identify potential: 5mins**

The aim of this process is to quickly identify and describe an existing activity that has the potential to be enhanced with Augmented Reality. Work through the following questions to guide your discovery.

**TOP TIP:** Sometimes it helps to choose a single person in your group, to act as the client.

**What are three common questions asked by your students?**

1. ____________________________
2. ____________________________
3. ____________________________

**What are three important things you want your students to understand, achieve or be able to do?**

1. ____________________________
2. ____________________________
3. ____________________________

**Are there any objects or real world locations associated with your answers above? list below**

______________________________
______________________________
______________________________

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**Step 2**

**Interpretation**

**Interpret needs: 5mins**

Now search for meaning in what you just learned. We think there are 8 common themes, that describe how we use Augmented Reality (there might be more!)

For at least one of your answers opposite, circle the words below that you most strongly associate with it.

- Analyze
- Evaluate
- Reveal
- Annotate
- Explain
- Review
- Apply
- Extend
- Organise
- Collabor
- Hijack
- Promote
- Combineate
- Identify
- Play
- Compare
- Illustrate
- Question
- Confront
- Imagine
- Recommend
- Create
- Inform
- Remember
- Critique
- Invent
- Search
- Differentiate
- Judge
- Share
- Educate
- Juxtapose
- Solve
- Engage
- Locate
- Summarize
- Entertain
- Match
- Understand

**Other....**

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_devised from 'Design Thinking for Educators' at IDEO.com_
For this mini design challenge we will focus on just one idea. Choose one that has great potential and scale it up.
You will have 1 min to share your idea with the rest of the group. This is competitive and there are prizes.

One BIG idea: 10 minutes
Step 3
Prototype