

Exploring Learning Spaces

Augmented, Virtual and Mixed Reality
at James Cook University

Danny Munnerley
Head of Learning Environments



\$1.9 Billion in future investment⁷

\$1.75 Billion JCU's contribution to human capital⁷



JCU Fletcherview Research Station

4,698 employees

On-campus accommodation for over 1,600 students



21,972 students from 108 countries

\$1.3 Billion in assets⁷



\$0.8 Billion JCU's economic impact⁷

5 Stars for skills development³

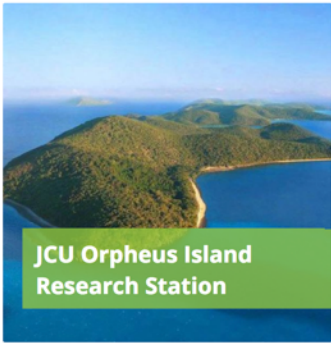
JCU Daintree Rainforest Observatory



'World class or better' in 35 areas of research⁶

5 Stars for student support³

Top 30 of Modern Universities⁴



JCU Orpheus Island Research Station

403 degrees and diplomas

No. 1 in Australia for employer satisfaction¹



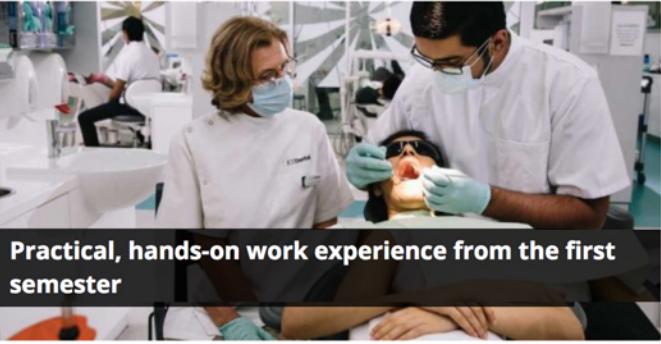
5 Stars for graduate job success³

5 Stars for full-time employment⁵



26 JCU specialised research centres and institutes

Research connections to 124 countries



Practical, hands-on work experience from the first semester

Top 2% JCU's Global Rank²

Townsville

Since 2009 JCU has
invested \$446m in
completed and planned
building projects in
Townsville



The Verandah
walkway

Biology and
Chemistry
Superlabs



Cairns

Since 2009 JCU has invested \$205m in completed and planned building projects in Cairns,



JCUAITHM

Student
Accommodation



Singapore

Established 2003
Fully accredited in
Singapore

Business, IT, Psychology
Education, Accounting
Arts, Aquaculture
Environmental Science
Games Design, Tourism
And Hospitality





Study centres

Also 4 other study centres in Brisbane, Mackay, Mt Isa and on Thursday Island











Research Stations and observatories



Experience life and work on a commercial cattle station.

In the heart of North Queensland's cattle industry, Fletcherview offers the field trip of a lifetime.



The Height of Rainforest Research

Experience the field trip of a lifetime in the heart of a World Heritage listed rainforest



Wake up on the Great Barrier Reef

From historic shipwrecks to Indigenous sites and reef flats to mangroves, Orpheus Island is your gateway to the region. We can accommodate up to 60 people.





ATTENDANCE MODES

Developing an integrated experience for fully online and on-campus learners

INTERNAL (on campus, f2f) - Subjects offered via internal mode **require regular attendance at classes** and *may* involve up to 30% online delivery.

EXTERNAL (online) - Subjects offered via online mode **require no on-campus attendance**. Study is facilitated wholly through LEARNJCU and *may* involve scheduled online sessions (e.g. via Blackboard Collaborate).

INTENSIVE - Subjects offered require attendance at classes conducted via block teaching sessions and can be on or off campus (typically on consecutive days, week, nights).

PLACEMENT (field-based) - Subjects require attendance at an external organization/location for work experience/practicum/clinical placement under supervision.

Enabling access to research stations and observatories
for **INTERNAL**, **EXTERNAL** and **FIELD BASED** study modes





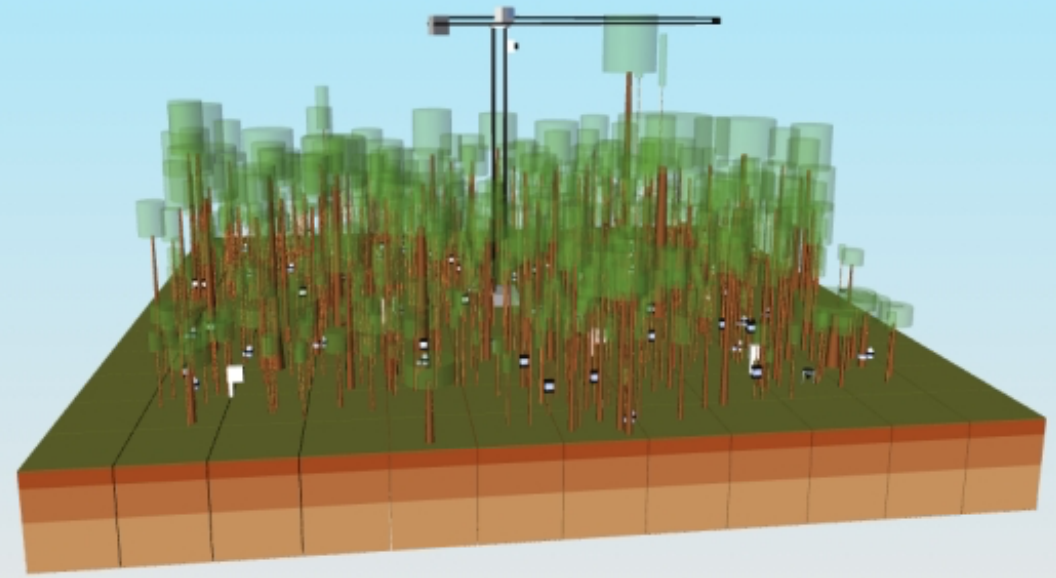
**PG
Research**

**Community
Engagement**

**Research
Stations**

**UG
Field Study**

**School
Engagement**



600 sensors giving researchers access to real-time data and video feeds from the Daintree Research Observatory.

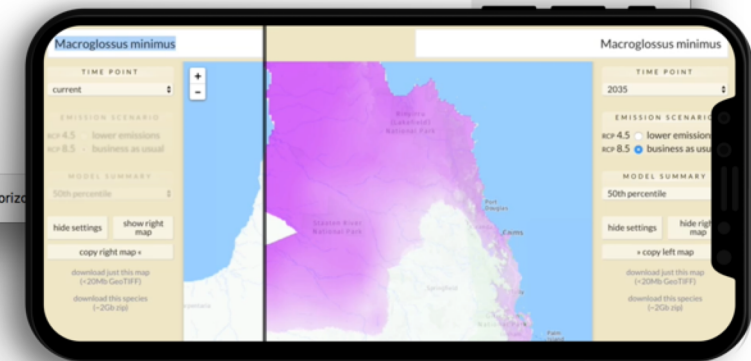
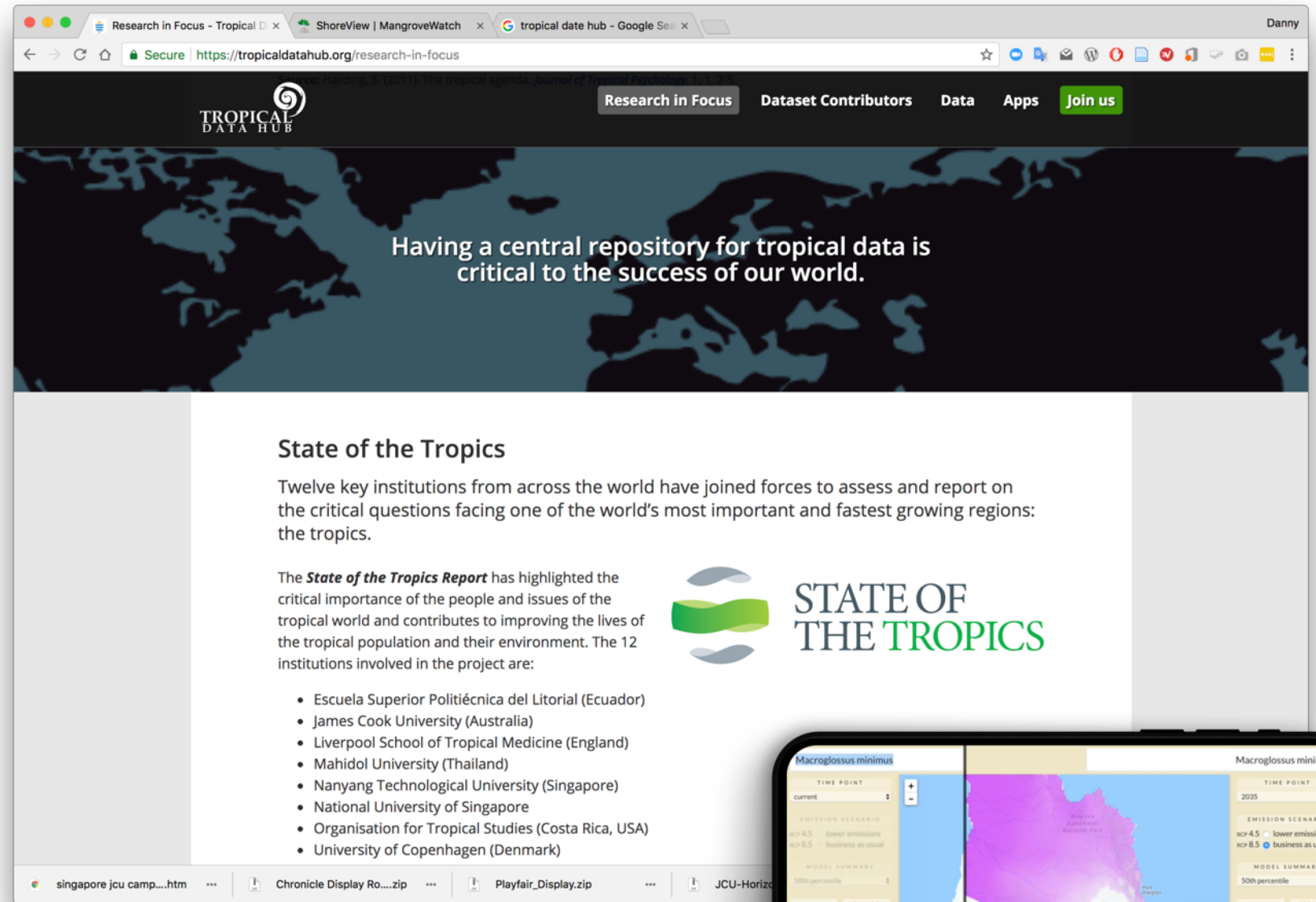
This includes 60 sap flow sensors, 60 automated dendrometer bands, 10 soil moisture pits, more than 90 temperature and humidity sensors, two weather stations, water flow sensors and cameras continuously recording different aspects.

By opening online access to the data, researchers will gain insights into complex processes such as hydrology, erosion, climate change and ecology.



- Central Repository
- State of the Tropic reports from 12 Institutions
- 16 Institutional datasets
- 2500+ published assets
- Open Data
- Citizen Science
- Discovery Apps

tropicaldatahub.org

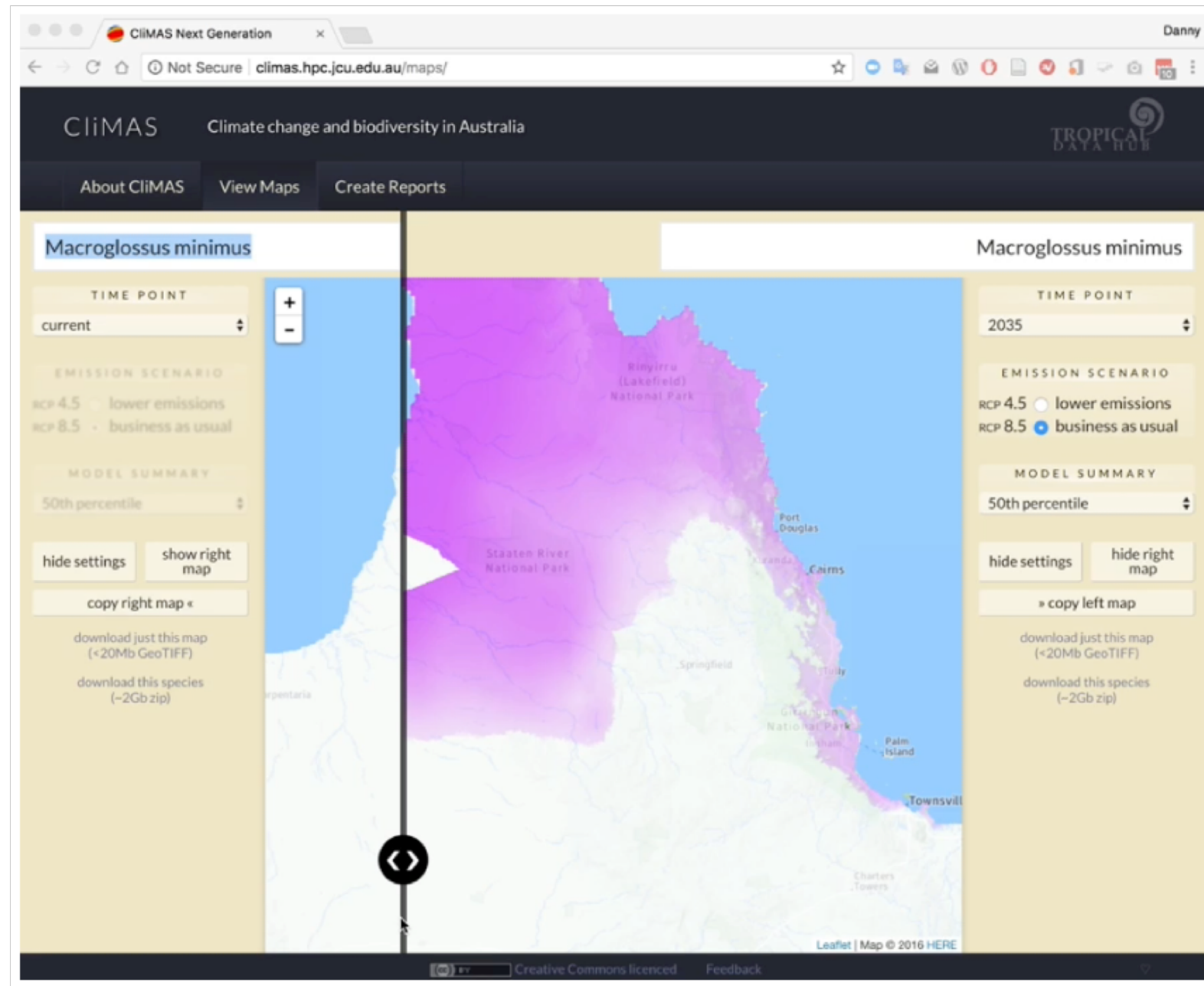


CLIMAS app - virtual study



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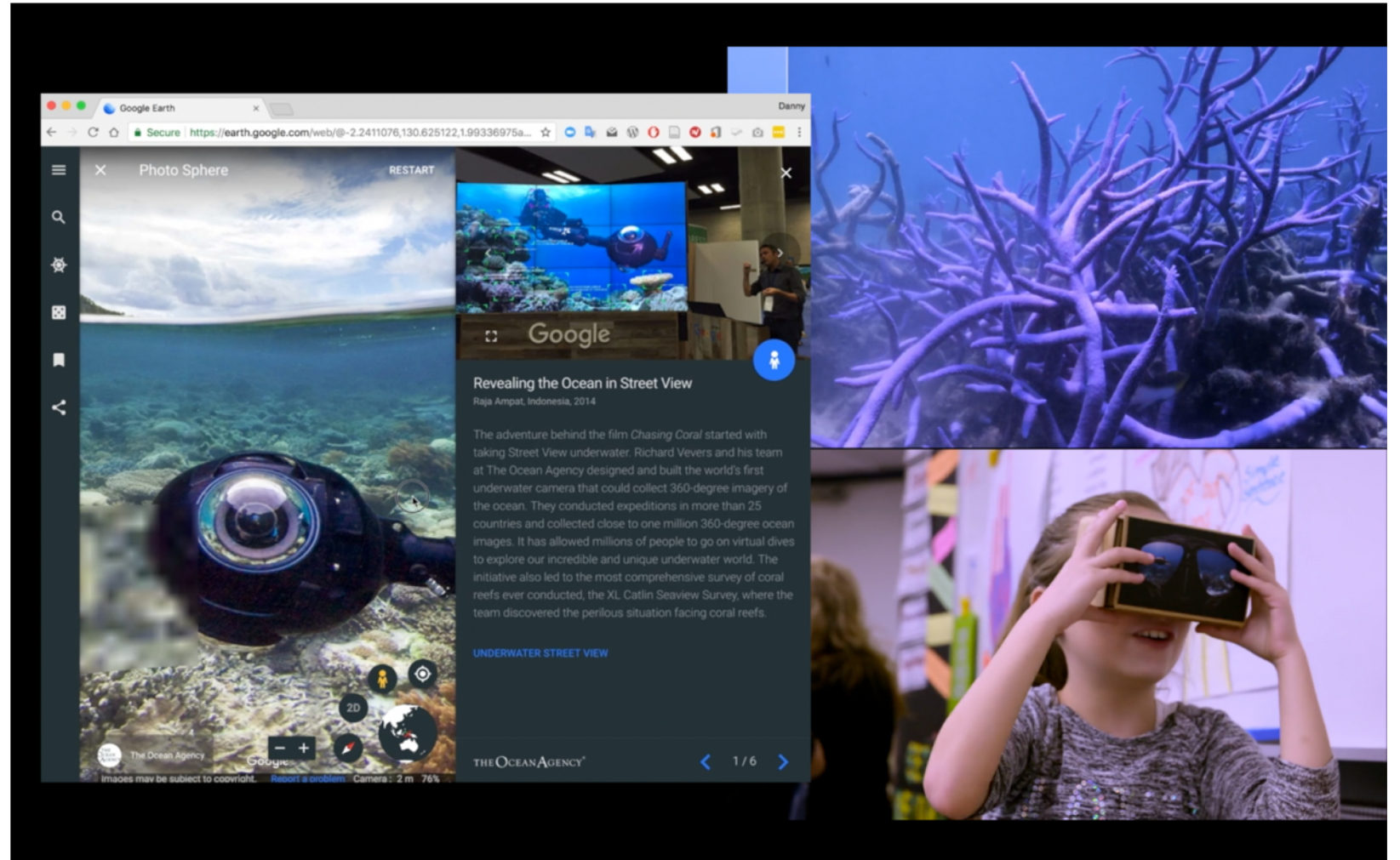
NETFLIX



POLYSYNCHRONOUS CASE STUDY:

Chasing Coral Documentary

- Google Expedition
- Google Cardboard
- Google Streetview



The Ocean Agency

THE OCEAN AGENCY

The Adventure Behind *Chasing Coral*

Coral reefs around the world are vanishing at an unprecedented rate. Join the adventure behind the Netflix Original Documentary, *Chasing Coral* as a team from The Ocean Agency sets out to reveal our changing ocean.

START EXPLORING


<https://youtu.be/EWQqXfXMu3k>



VR - Chasing Coral Danny

https://www.chasingcoral.com/vr/


CHASING CORAL
AN EXPOSURE LABS PRODUCTION



VIRTUAL REALITY

We are thrilled to offer groups the opportunity to go below the waves. Our VR assets include *Chasing Coral: The VR Experience* film and The Ocean Agency's Google Expeditions!

CHASING CORAL – THE VR EXPERIENCE

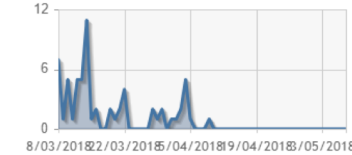
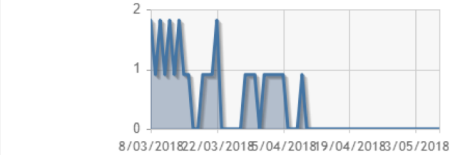


Summary Share Edit Security Publish Analytics More Delete

Dashboard Refresh Download Report

Presented By: James Cook University
Recorded: 8/03/2018 12:55 PM EAST
2 Hours 4 Seconds
Last Refreshed: 8/05/2018 2:04 PM

Performance

8/03/2018 2/03/2018 5/04/2018 9/04/2018 3/05/2018

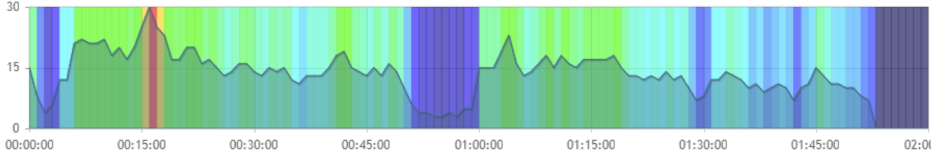
8/03/2018 2/03/2018 5/04/2018 9/04/2018 3/05/2018

VIEWS
63

PEAK CONNECTIONS
2

LIVE	ON DEMAND	FIRST	LAST	TIME WATCHED	AVERAGE WATCHED
0	63	8/03/2018	9/04/2018	21:42:56	00:20:40

Trends

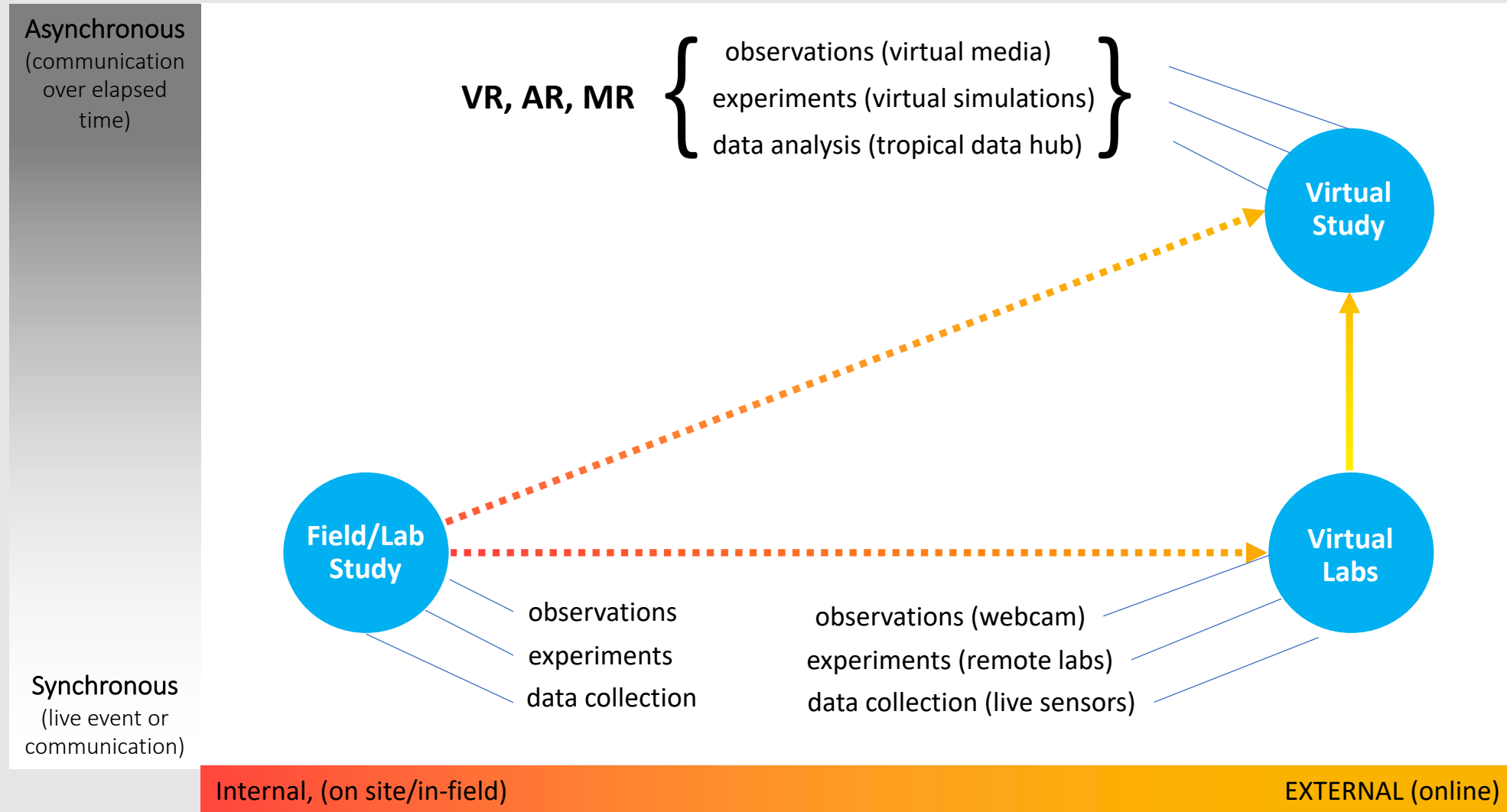


00:00:00 00:15:00 00:30:00 00:45:00 01:00:00 01:15:00 01:30:00 01:45:00 02:00:00

Top Users Users

User	Views	Time Watched	Coverage
jc258886	5 7.04 %	0:49:02	0:43:19
jc321298	5 7.04 %	1:42:41	1:07:58
jc493229	5 7.04 %	2:09:36	1:24:31
jc466548	4 6.35 %	1:33:17	1:08:37
jc483038	4 6.35 %	0:07:11	0:07:11
jc466556	3 4.76 %	1:29:54	1:28:26
jc487616	3 4.76 %	0:25:53	0:24:45
jc492353	3 4.76 %	1:39:31	1:38:30

Polysynchronous Learning



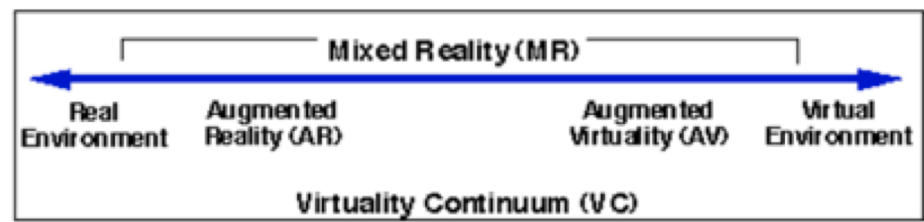
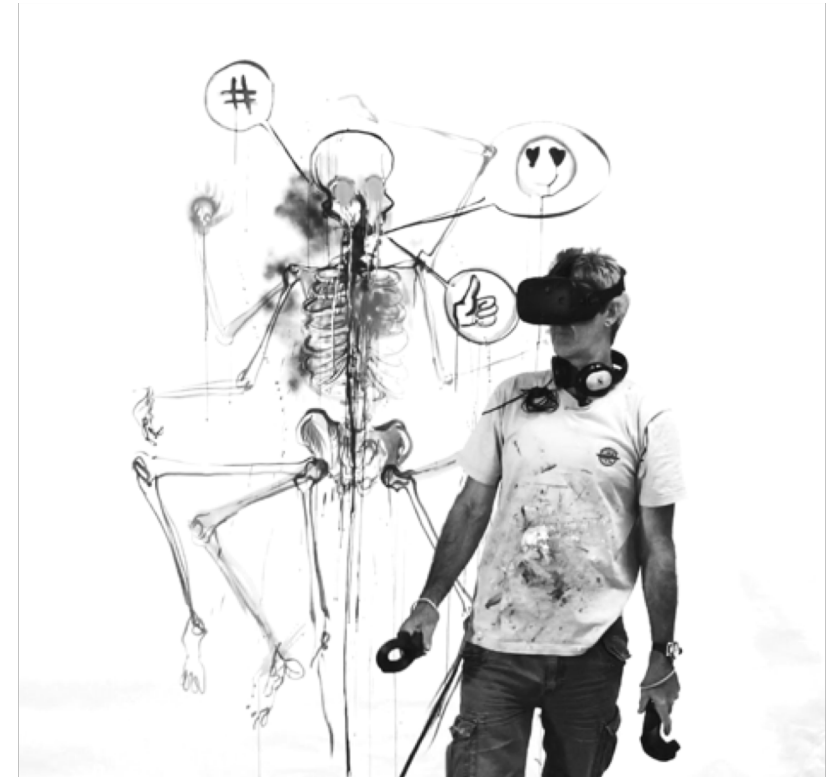
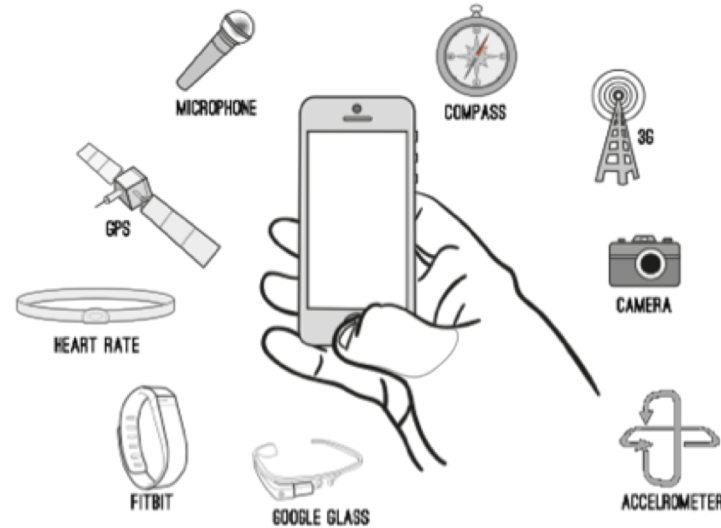
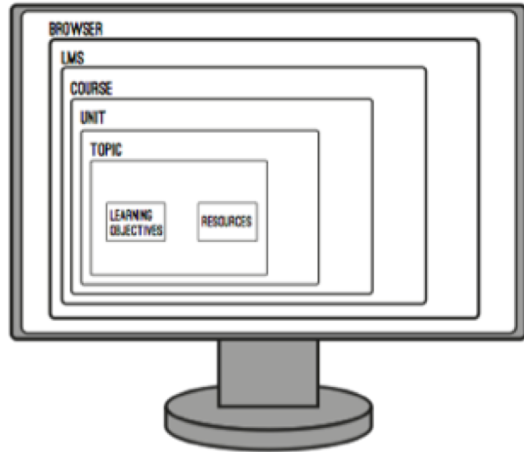


Figure 1: Simplified representation of a "virtuality continuum".

Learning Platform - paradigm shift



Munnerley, D., BACON, M., Wilson, A., Steele, J., Hedberg, J., & FITZGERALD, R. (2012). Confronting an Augmented Reality. In D. Hawkrige, S. Verjans, & G. Wilson (Eds.), *ALT-C 2012: A confrontation with reality* (Vol. 20, pp. 39-48). (Research in Learning Technology). United Kingdom: Association for Learning Technology (ALT). DOI: 10.3402/RLT.V20I0.19189

Illustration in VR, Simon Spillsbury

<https://www.youtube.com/watch?v=2f9AT7QxS80>

VR

National University of Singapore Medicine

Virtual Interactive Human Anatomy (VIHA)
Associate Professor Suresh Pillai,



The screenshot shows a web browser displaying an article on the VRFocus website. The article title is "NUS Medicine Using Virtual Reality To Replace The Need For Cadaver". The author is Nikolhai Koolonav... and it was last updated on Jun 5, 2018. The article text states: "With all the advancements in virtual reality (VR) it is no surprise that the National University of Singapore's Yong Loo Lin School of Medicine (NUS Medicine) is using the technology to further their educational training." The article includes a large image of a person using VR equipment and a smaller image of a person wearing a VR headset. The website header includes the VRFocus logo and navigation links for News, Features, Previews, Reviews, Videos, and VRDI. The footer contains a cookie consent notice and links for Accept and Privacy policy.

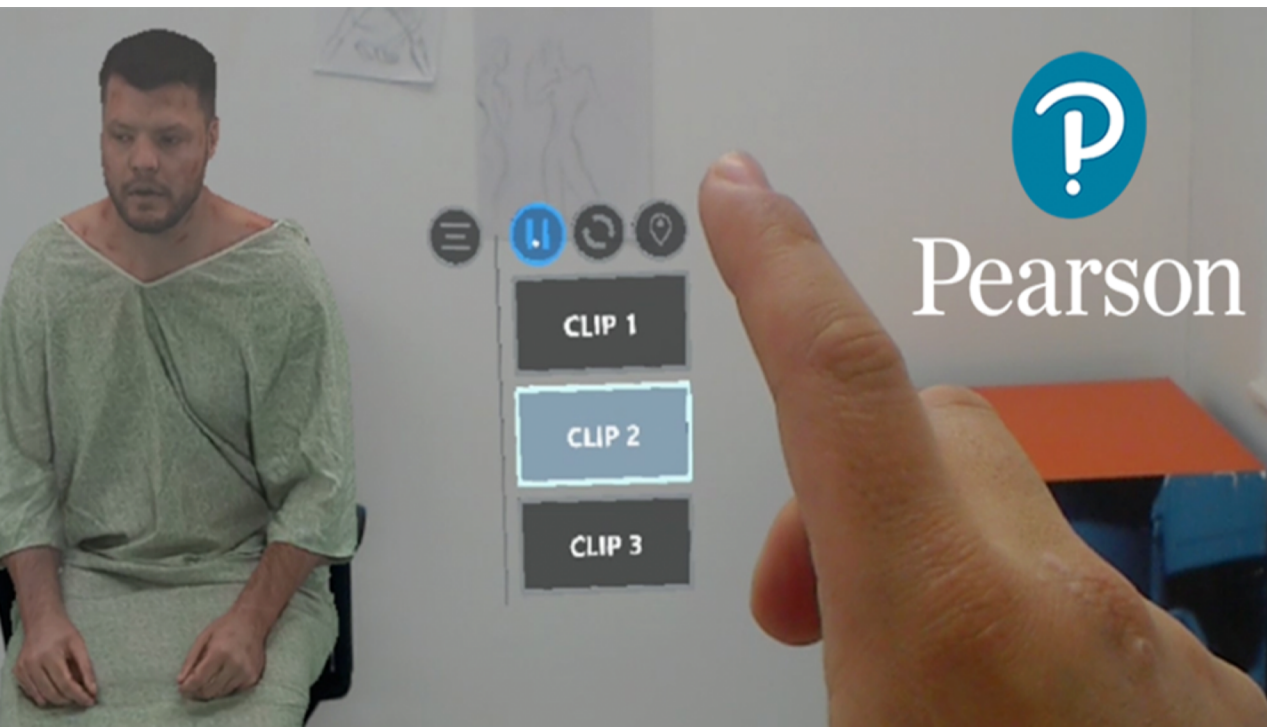
MR

Pearson Hololens (Health/STEM)

HoloBody, HoloPatient, HoloChemistry, HoloHistory



 Pearson <https://www.youtube.com/watch?v=V9wrRJmc3fA>



HoloPatient

<https://www.youtube.com/watch?v=luvCaUmf5lc> 

MR

University of Canberra Standard Patient

Assistant Professor Jane Frost & Lori Delaney



<https://www.youtube.com/watch?v= ORnPuJIAIU>

The screenshot shows a web browser window displaying a news article. The browser's address bar shows the URL: <https://www.canberratimes.com.au/national/act/university-of-canberra-nursing-students-treat-hololens-hologra...>. The page header includes 'Our network' and 'The Canberra Times' logo. The article is categorized as 'NATIONAL ACT' and has the headline 'University of Canberra nursing students treat HoloLens hologram patients'. It is written by Emily Baker and dated October 6, 2017. The article text states: 'These patients don't mind if you get too close or take your time. University of Canberra nursing students are learning to conduct visual assessments using holographic patients in an Australia-first trial.' Below the article is a video player showing a student in a green gown sitting in a chair, with a 'Share Image' button in the bottom right corner. To the left of the article is a 'TODAY'S TOP STORIES' sidebar with three items: 'POLITICAL INFIGHTING' (NSW Nats leader), 'ETHIOPIAN AIRLINES CRASH' (Boeing 737 MAX 8), and 'WORLD MARKETS' (Global economy hits weakest spell). A 'DIGITAL INQUIRY' section is also visible at the bottom of the sidebar.

NATIONAL ACT

University of Canberra nursing students treat HoloLens hologram patients

By **Emily Baker**
October 6, 2017 – 5:06pm

f t e | A A A

TODAY'S TOP STORIES

POLITICAL INFIGHTING
'Shut up': NSW Nats leader unleashes on federal colleagues for wrecking state campaign
20 minutes ago

ETHIOPIAN AIRLINES CRASH
Boeing 737 MAX 8 flights to Australia to continue after twin disasters

WORLD MARKETS
Global economy hits weakest spell since the financial crisis

DIGITAL INQUIRY
'Unparalleled power': News Corp calls on ACCC to break up Google

These patients don't mind if you get too close or take your time.

University of Canberra nursing students are learning to conduct visual assessments using holographic patients in an Australia-first trial.

A holographic patient. MARCUS BUTLER

Assistant Professors of Nursing Jane Frost and Lori Delaney introduced the HoloPatient program to second-year nursing students last semester.

The technology allows students to interact with holographic patients projected into the classroom

MR

Immersive studio

Griffiths University

360 video, presenter immersion, live stream
future options for volumetric video





Augmented
Virtuality



MR

Magic Leap

Synaesthetic Design



<https://www.youtube.com/watch?v=LLmT0tH3LKM>



XR HUB & BLING GRANTS





with 360° stories

Using extended reality to enhance international-mindedness towards Australia's Pacific neighbours in the French language classroom.

Currently we have mobility programs where students go abroad and experience cultures, people, languages, and environmental landscapes. What if we captured some of that experience in VR and brought it back to the classroom?



Captured with the Insta360 One X



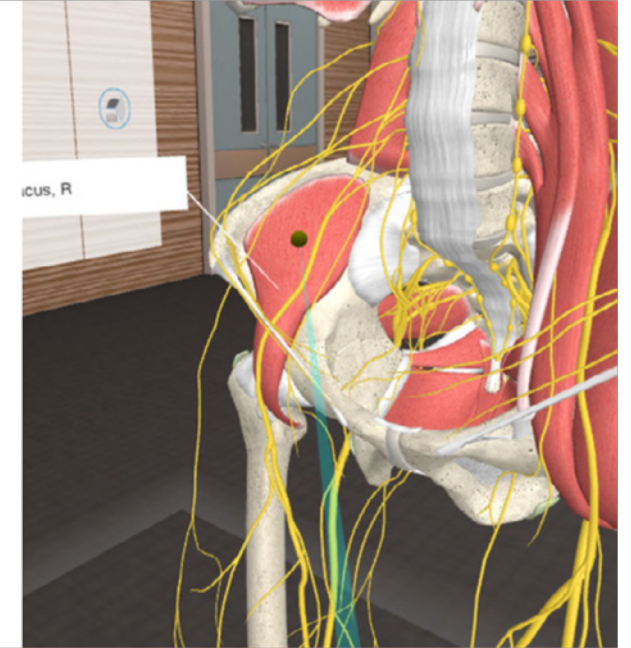
Viewed with the Oculus Go

Exposing learners to the 3D Organon VR Anatomy app on the HTC Vive and an anatomy app on the iPad.

Documenting the students experience of both the Vive and iPad app. Gaining a better understanding of how these tools might be used and how learners engage and interact with them.



3D Organon VR Anatomy app on the HTC Vive



360° research facility and lab tours

Capturing 360° tours along with working on integrating them into learning material delivered via the Virtual Learning Environments.



Midwifery lab at JCU

Virtual Reality Equipment Hub

Embedding emerging technologies into our digital experience, first starts with making them more available.

The JCU Virtual Reality Equipment Hub will operate as a loan facility for JCU students and staff to access entry-level virtual reality equipment for the purpose of developing or participating in immersive learning experiences. The VR equipment will be accessed via the existing library loan systems in Townsville and Cairns with the same borrower registration and tracking capabilities.

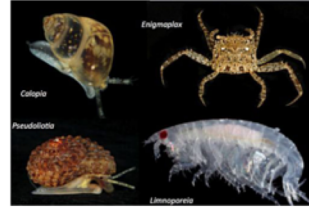


Standalone Oculus Gos will be at the forefront of the Hub





360 Fieldwork in Aquatic Ecosystems



Captured out on the field



Viewed with the HTC VIVE

The project will use off-the-shelf VR cameras and headsets to record and present VR 3D videos.

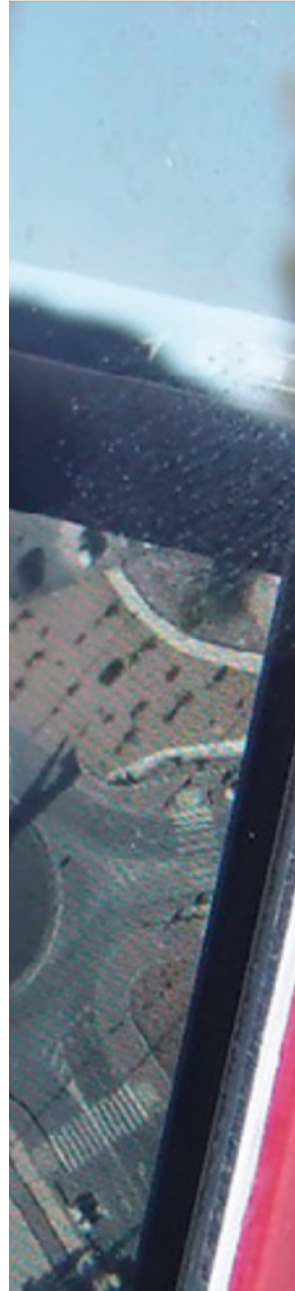
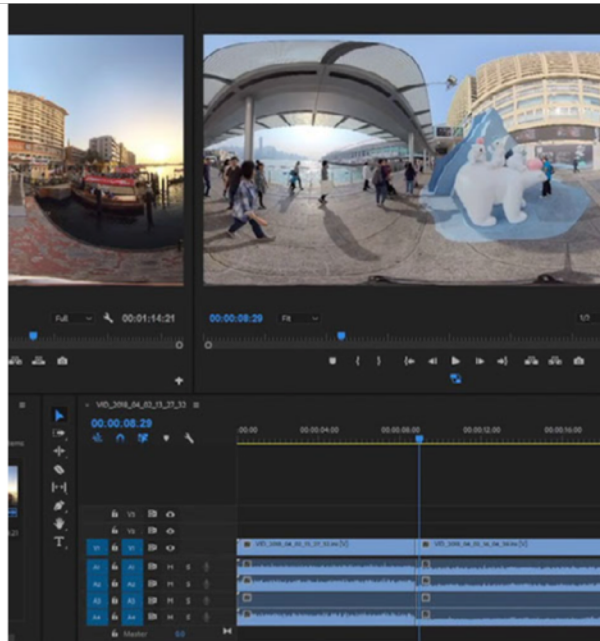
Lecture and laboratory sessions will be recorded, and student trial will be carried out to evaluate the benefits.



Captured with the Vuze XR - Dual 2D 360° and 3D 180° camera



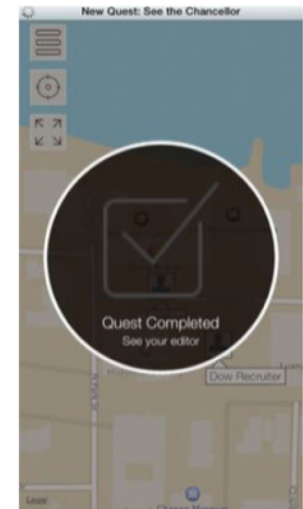
Captured with the Insta360 One X



ARIS gaming software for AR

Developing a series of 'quests' around informing students of safety features present in our science teaching laboratories.

Using ARIS gaming software to create a questing game that students access utilising mobile devices.



Geolocation quest gaming



Thank you
danny@munnerley.com