

Knowledge Exchange Seminar Series (KESS)

...is a forum that encourages debate on a wide range of research findings, with the overall aim of promoting evidence-based policy and law-making within Northern Ireland



Role of Virtual Reality in Geography and Science Fieldwork Education

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3D virtual environments and virtual reality









Mobility

Second Life Virtual Skiddaw: 3D Virtual geology Field Trip (Unity 3D) 360-degree videos in the browser and via the virtual reality viewer Google Expeditions app: 360degree photospheres











Preparing for the real world - geology field trip





Video: Virtual Skiddaw - virtual geology field trip



Videos are at: <u>https://www.youtube.com/watch?v=5_h4NI3AvCY</u> and <u>https://www.youtube.com/watch?v=MOdu5jQukUk</u>



Google Expeditions kit



Tablet Smartphone Cardboard Viewer

Router



Virtual field trips









The Great Barrier Reef during a bleaching event Borneo Rainforest – mangroves on salty land

Chernobyl

International Space Station





An inquiry process

Focus: Geography and Science education



Geographical or scientific inquiry





Empirical research

Schoollessons science (n=14) geography (n=10) students (n=549) year 4 to year 11

Interviews

science teachers (n=11) geography teachers (n=9) curriculum experts (n=6)

Workshops



Class preparation



Inquiry-based learning activity sheet











Higher-order question:

"Can the colour of the coral before it's been drained come back?" (Year 8, Geography, Climate Change and The Great Barrier Reef Expeditions)

Teacher's comment:

"You'd need to explain why, the fact that it was variable on the coral. It links to the idea of resilience" (Geography teacher)

Higher-order question:

"How did the mangrove leaves adapt to take in the salt?" (Year 10, Geography, Borneo: Plant Adaptations Expedition)

Ulster

Teacher's comment:

"That's really interesting because they're asking why now. They know they do, now they want to know how" (Geography teacher)







Before outdoor fieldwork



"

Familiarisation with locations:

Allow students to plan ahead for how long it will take them to access the site and to carry out the physical measurements. **J**



During outdoor fieldwork - global to local



"

It helped me to understand the Chilterns is an area of natural beauty compared to some places in the world. It helped me to feel more caring about the Chilterns.



After outdoor fieldwork – local to global



"

We did go on a little tour of the graveyard to look at how rocks are being used in the churchyard and in the church, so GE is going to be taking you to places where I can't actually take you because it's too far and it's too expensive. **J**



Affordances of Google Expeditions



360-degree visual authenticity



360-degree navigation



3D view



Emphasis *and* In-situ contextual information



First-person perspective



Near view



Single-user handling



Synthesis



Adoption barriers





Recommendations

Role of virtual reality-based field trips in the curricula

fieldwork education (educators and students)

other disciplines: ecology, history, archaeology

initial stimulation for inquirybased learning environmental education

cross-disciplinary interactions

further and higher education

Professional development of educators

integrating technology in curricula

evaluation of technologybased innovations



Project website: http://www.shaileyminocha.info/google-expeditions/; has links to blog-posts

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