Role of smartphone-driven virtual reality field trips in inquiry-based learning

King’s Ely Junior School: Alan Parkinson
FSC: Steve Tilling
GA: Becky Kitchen
OU: Ana-Despina Tudor and Shailey Minocha

Funded by Google and The Open University, UK

21.04.2017
Outline

- Virtual reality
- Smartphone-based virtual reality: Google Expeditions
- Our research goals
- Geographical enquiry and role of virtual reality
- Results from our empirical research

What is virtual reality?

A simulated environment on a computer or mobile platform (e.g., smartphone, tablet):
Google Expeditions

- Tablet
- Smartphone
- Cardboard Viewer
- App
- Router

Google Expeditions App

- Free app, available on Android and iOS platforms
- Over 500 expeditions (three types)
  - physical locations, e.g. London Olympic Park, International Space Station
  - simulations, e.g. process of photosynthesis and pollination
  - career expeditions, e.g. day in the life of a software developer, Dean of an Engineering Faculty
- Each expedition has
  - Photospheres (360° view) with some explanatory text, points of interest and questions (Guide mode)
  - Google Cardboard viewer gives the 3D view (follower mode)
Our research goals

- Whether and how virtual reality-based Google Expeditions (GEs) can be integrated in the Geography and Science curriculum
  - Teaching concepts and phenomena
- How can GEs support enquiry?
- How can GEs complement physical field trips?

Our empirical work

- in schools
- workshops
- interviews
- qualitative data analysis
**Geographical enquiry and Google Expeditions**

- Creating a need to know
- Questioning
- Collecting data
- Making sense of the data
- Reflecting on learning

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**Geographical Enquiry – Lesson Example**

- Tropical rain forests and plant adaptations in Borneo
  - Introduction of the topic and learning outcomes by the teacher
  - Students look at the expedition; carried out think-pair-share activity
  - After the expedition: students completed an activity sheet individually – writing the questions that they would like to investigate
  - Capturing their experiences: how did virtual reality help you to understand the characteristics of Tropical Rainforests?
Enquiry for physical field trips

Pre-physical field trip → During a Physical field trip → Post-physical field trip

Pre-physical field trips
- Planning the enquiry process
- Example – visiting London Olympic Park
  - To assess East London in its wider geographical context and its economic potential post-Olympics, particularly the transport and commercial infrastructure in Stratford
  - To evaluate how far this is likely to be a sustainable regeneration
  - To assess the feelings of local people about the regeneration of Stratford including the 2012 Olympic and Paralympic Games.
How enquiry is facilitated by virtual reality

- case study or story
- as initial stimulus material or an initial ‘hook’ to raise curiosity and interest
- initial question as a trigger for evidence collection

Resources and contact details

- Project website: http://www.shaileyminocha.info/google-expeditions/
  has links to blog-posts
- email addresses: shailey.minocha@open.ac.uk
  ana.tudor@open.ac.uk
- Twitter: @ShaileyMinocha @AATudor