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

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

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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):

Second Life
Virtual Skiddaw: 3D Geology Field Trips (Unity 3D)

Mobility
Google Expeditions App
Smartphone-driven virtual reality app involving Tablet, Phone and Google Cardboard

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

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/](http://www.shaileyminocha.info/google-expeditions/); has links to blog-posts

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