3D virtual geology field trips

Conference or Workshop Item

How to cite:

For guidance on citations see FAQs.

© 2013 The Open University

Version: Version of Record

Link(s) to article on publisher’s website:
http://aquarobo.com/abyss/MIWoSE.htm

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online’s data policy on reuse of materials please consult the policies page.
3D Virtual Geology Field Trip

Dr Shailey Minocha
email: shailey.minocha@open.ac.uk
Second Life: Shailey Garfield

Being in Second Life

• enjoyable
• sense of presence, co-presence
• sense of engagement
• collaborative learning
• contextual learning
Projects in Second Life

- socialisation
- team working in distributed teams
- design of 3D learning spaces
- navigation and wayfinding in 3D learning spaces

Institutional perspective

- software not owned by us
- control
- availability
- not perceived for education alone
Funding came through in 2012

• Chose virtual Geology trip as the candidate App for development
• Compared: Unity 3D, Open Sim, Second Life
• Chose Unity 3D as the platform
  – browser-based App
  – stand-alone App and not a part of a social world

3D Virtual Geology Fieldtrip

• scope to demonstrate interactivity, sense of being there
• realism and high degree of fidelity
• visual and spatial experience not constrained by a ‘flat’ 2D user interface
• helps internalise the sense of exploration
Field trips in our institution

- Real field trips two or three times a year (tutor-led)
- DVD to facilitate reflection and activities
- DVD also helpful for students who are unable to go for real field trips

Lake District in the UK

- Skiddaw field area
- 6 sites (site 1 in Phase 1 of the project)
- Skiddaw group of rocks: sandstone, slates, granite
- Geological significance
  - How metamorphism varies in the Skiddaw group sedimentary rocks due to the intrusion of the Skiddaw granite
  - How the Skiddaw group rocks deformed during the mountain-building event
Video Part 1 (what to look for?)

- audio and textual guidance (tutor-led)
  - introduction
  - Geology of the area
  - instructions for learning activities
- choice of avatars
- choosing equipment for the field trip
- list of learning activities
- using the compass, sketch points and sketching

3D Virtual Geology Fieldtrip App

- Realism
  - design of the environment or landscape
    - LIDaR data
    - Photogrammetry data
    - 3D modeling to weave it together
  - learning activities (similar to a real field trip)
    - choosing the equipment, learning to use the compass, sketching rocks
Video Part 2 (what to look for?)

- student investigates grain composition of one rock
- overlaying maps on the landscape
  - ordnance survey map
  - Geology map
- cross-section of the mountains
  - showing the rocks (geology) underneath
- different views in each of the contexts
  - overhead, North-East, North-West, etc.

3D Virtual Geology Field Trip App

- Non-realism (things you can’t do in a real field trip)
  - microscopic views of rocks within the environment
  - draping maps on the landscape
  - cutaways into the mountainside to see the geology underneath
Opportunities for students and educators

• practice/training for real life field trips
• reflect on your experiences of real field trips
• fly across the landscape
• additional field trip to a real field trip
• could replace a real field trip if resources are limited

Limitations: student learning and experiences

• risk awareness skills
• challenges of being outdoors
• challenges posed by the weather
• challenges of using the equipment in real life
• bonding with other students
Challenges of 3D virtual field trips

• costs involved in design, development and evaluation
• multi-skilled team and specialist developers are required
• student training
• overcoming the (negative) perceptions that people have about virtual field trips
• how best to communicate that virtual field trips are not being proposed to replace real field trips

For further conversations

• Shailey Garfield (Second Life)
• Email: shailey.minocha@open.ac.uk
• Profile: http://uk.linkedin.com/in/shaileyminocha
• Publications: http://oro.open.ac.uk/view/person/sm577.html