

Blended Learning Field Trips and Their Role in a Post- COVID-19 World:

**Evaluating digital education technologies
used to enhance student field trips**

A.P. Clarke, C.M. Brennan, T.M. Mitchell, P.R. Bown and E.J. Liu



UCL

New technologies to make emersive & engaging educational content are available.

How we use them to support & enable learning is critical to their success.

Case Studies From:

Dorset Coast
Bradgate Park, Leics.
Pembrokeshire, SW Wales
Southern Spain

3rd year UG
2nd year UG
2nd & 3rd year UG + MSc
3rd year UG + MSc

Sept 2021
Nov – Dec 2021
Apr 2022
Upcoming

Seeing in 3D

Appreciate scale

Make own observations

Learn to travel safely

Why do we do fieldwork?

Challenge understanding

Consolidate learning

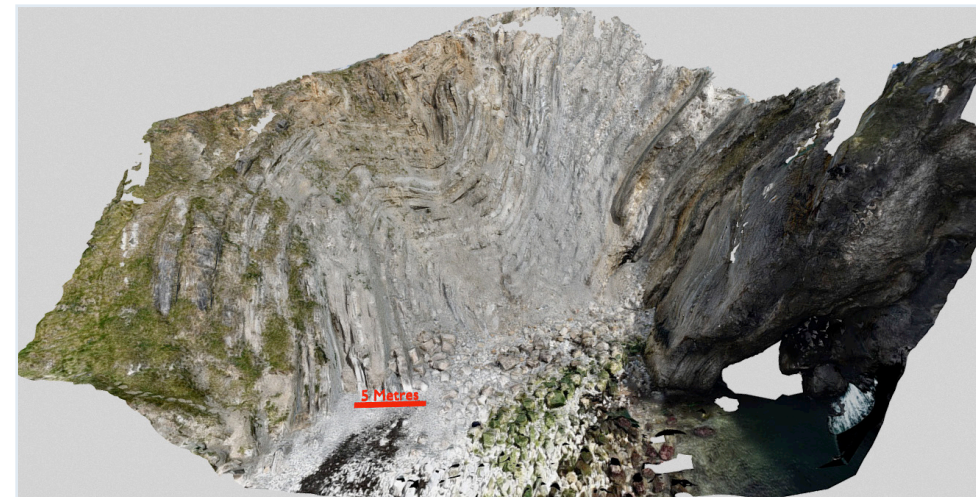
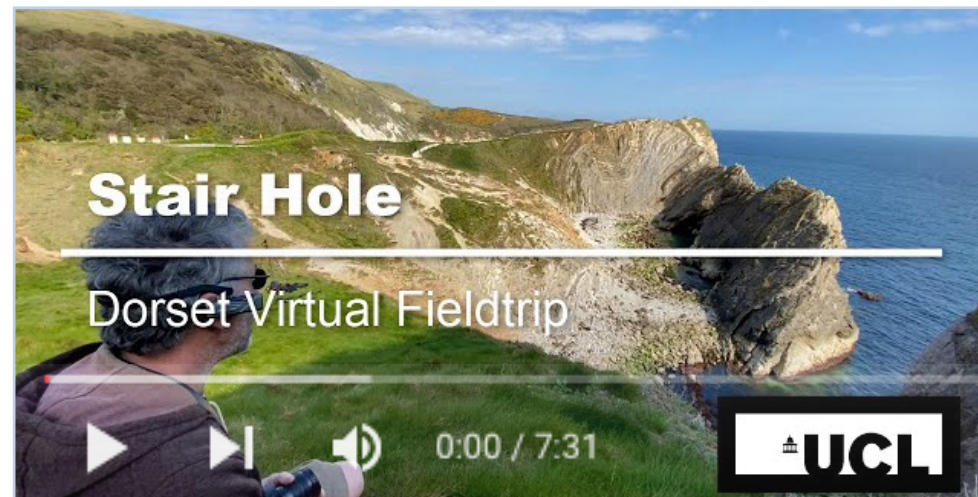
Real world experience

Students like it



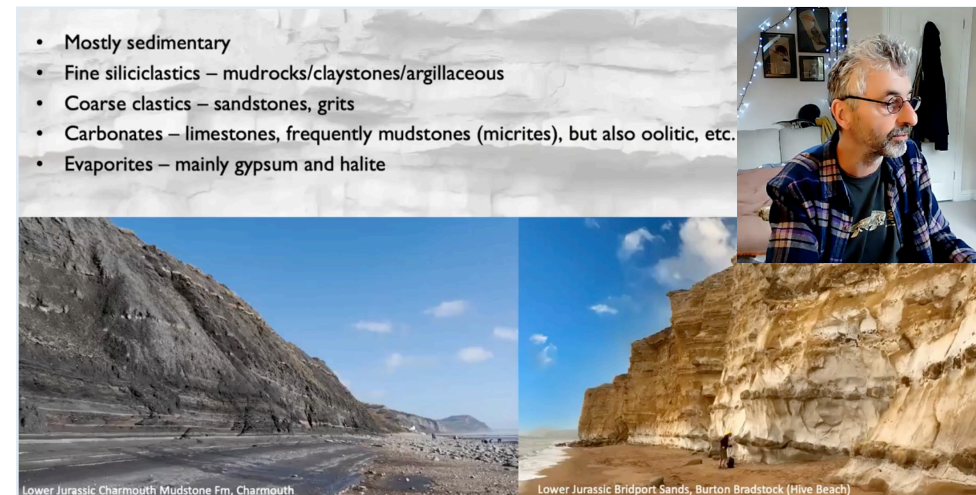
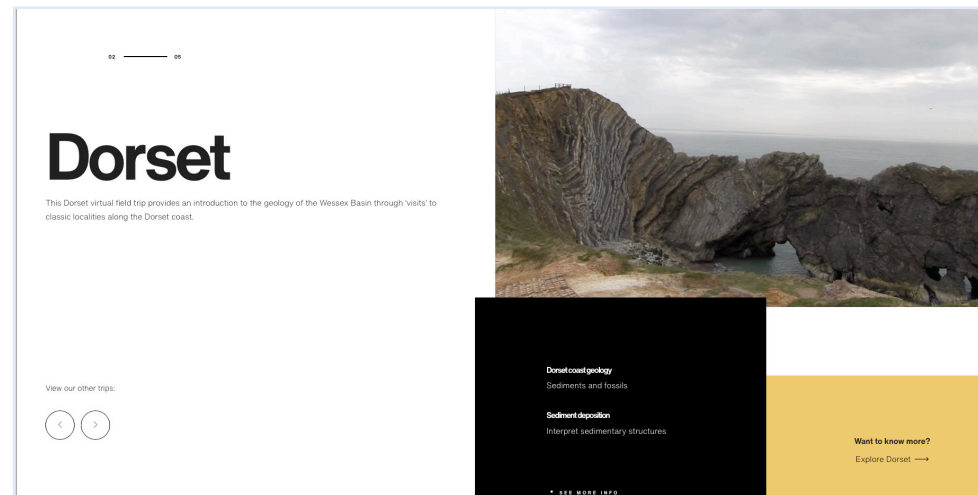
Fieldwork in the Pandemic

Edited Videos



3D Models

VFT Website



Live Sessions

Advantages of Virtual Fieldwork

New perspectives

- Small details
- Big picture
- Distant features
- Impossible angles

Directing attention

- Guiding the eye
- Annotations & labels
- Eliminate distractions

Accessibility

- No need to visit inaccessible spaces
- Improved visibility

Environment

- Fewer emission-producing journeys
- Preserve outcrop for future study

Types of Virtual Material



- Edited videos**
- Macro/close-up field photos**
- Interactive maps & field guides**
 - Annotated field photos
 - Annotated 3D outcrop models

- 3D outcrop models**
- Gigapixel panoramas**
 - Overview field photos
 - 360° photos & video
 - Virtual reality



Types of Virtual Material

Directed Attention

Edited videos

Macro/close-up field photos

Interactive maps & field guides

Annotated field photos

Annotated 3D outcrop models

Undirected attention

3D outcrop models

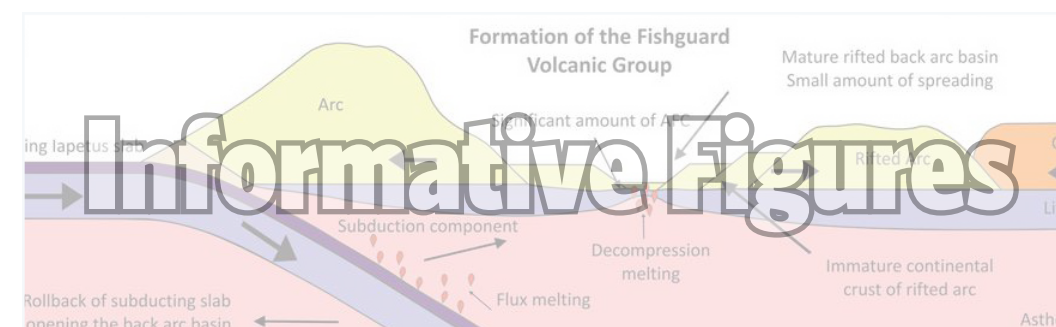
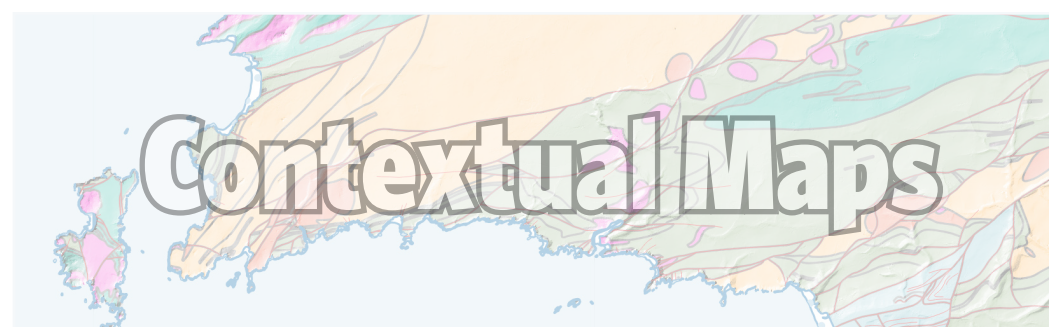
Gigapixel panoramas

Overview field photos

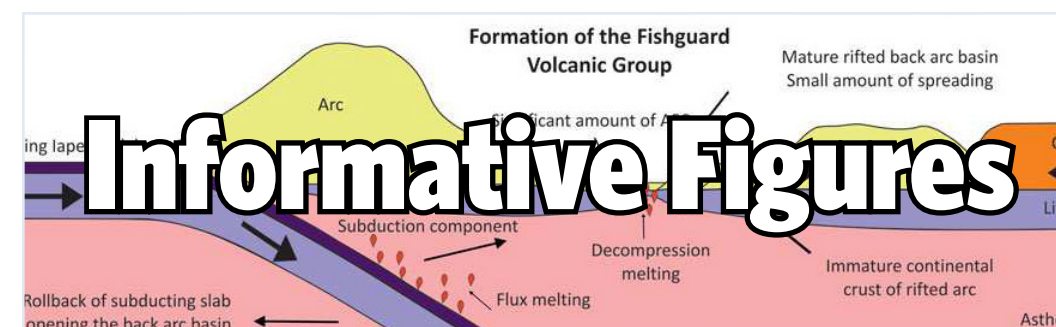
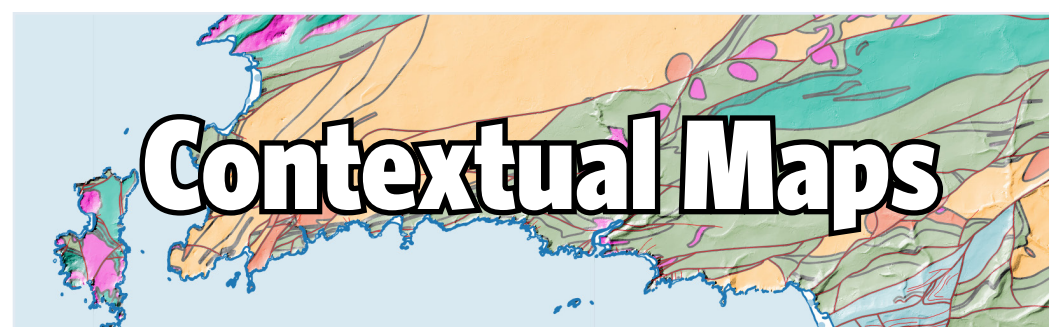
360° photos & video

Virtual reality

Edited Videos



Edited Videos



Directed Attention in Videos



Camera Movements



Rack Focus



Dolly Zoom

High-Quality Field Photos

Macro Photos



Gigapixel Panoramas

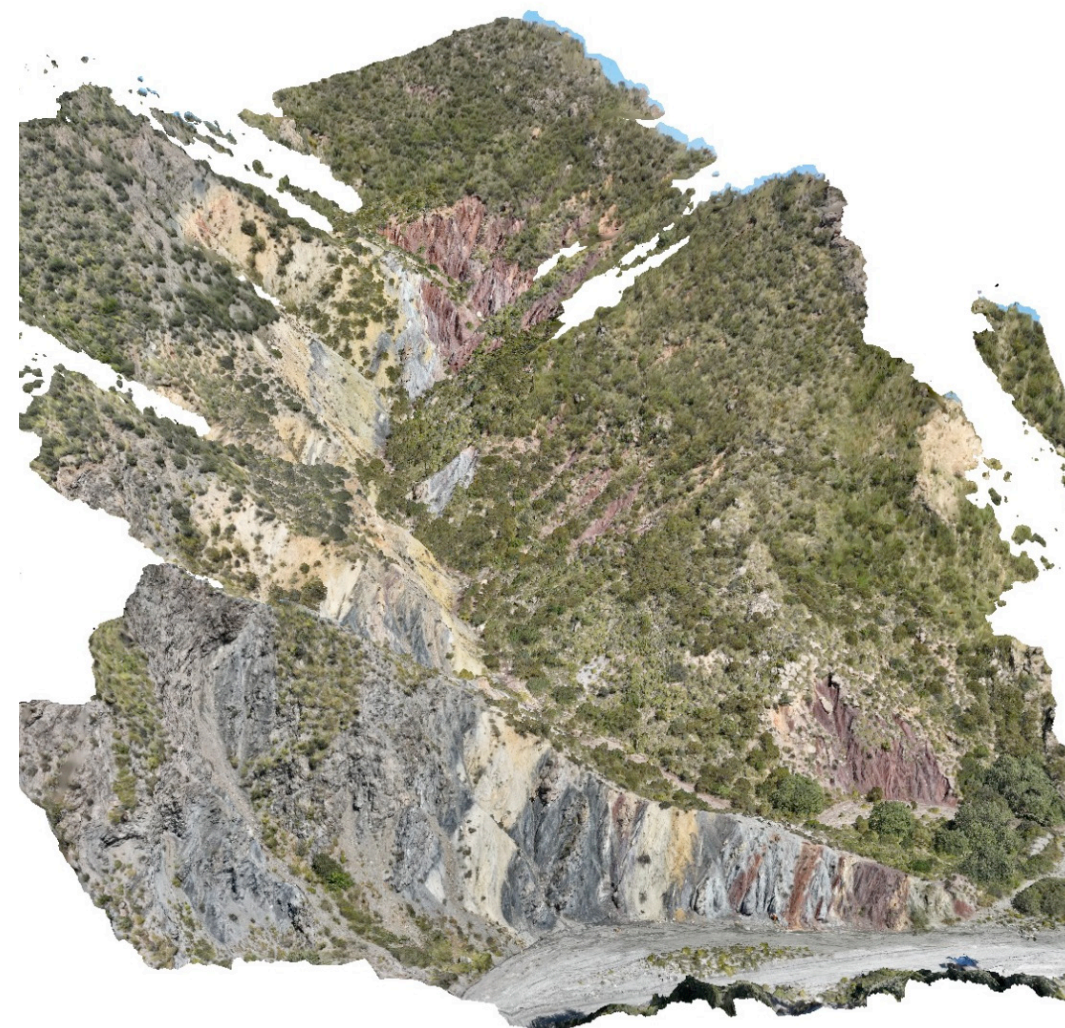


3D Outcrop Models

High-quality photogrammetry models allow students to make their own primary observations in 3D from virtual material.

3D outcrop models allow students to investigate an outcrop from perspectives which would otherwise be impossible.

See poster by Chris Brennan.

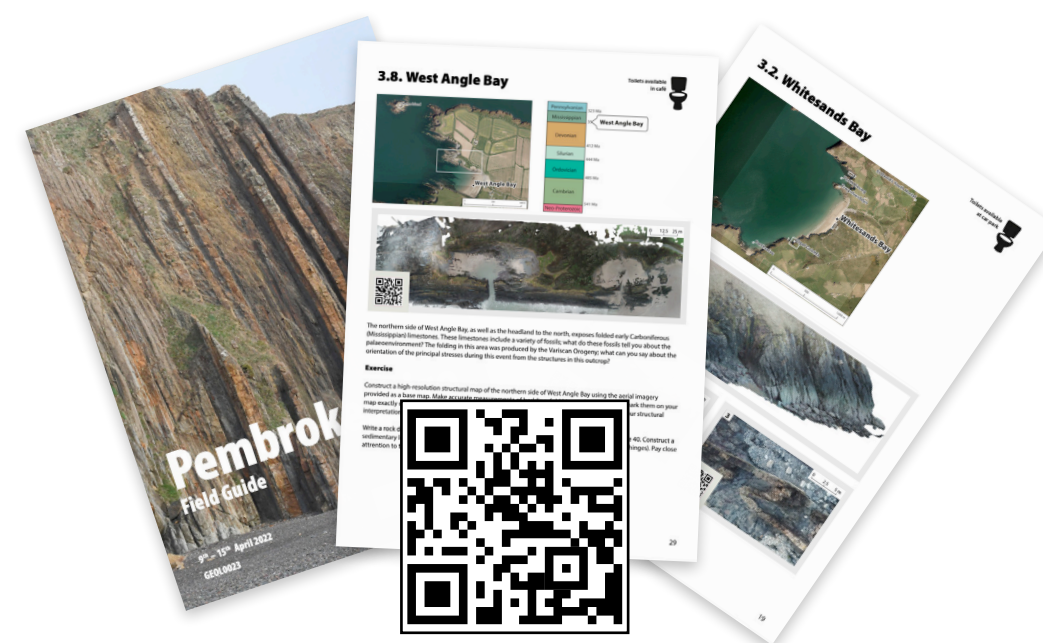


Interactive Field Guides

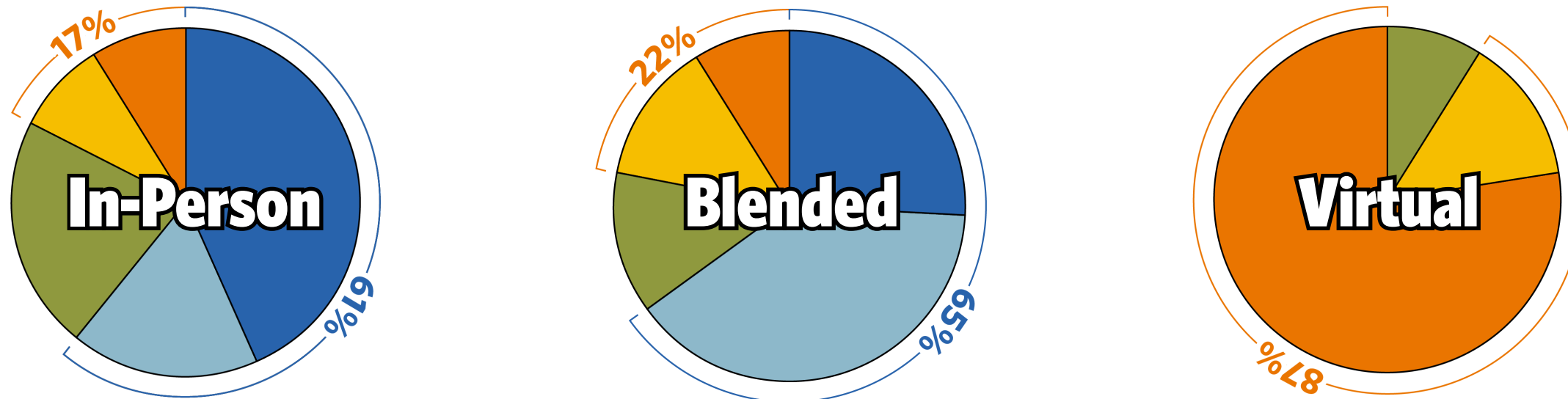
Google Earth Field Guide



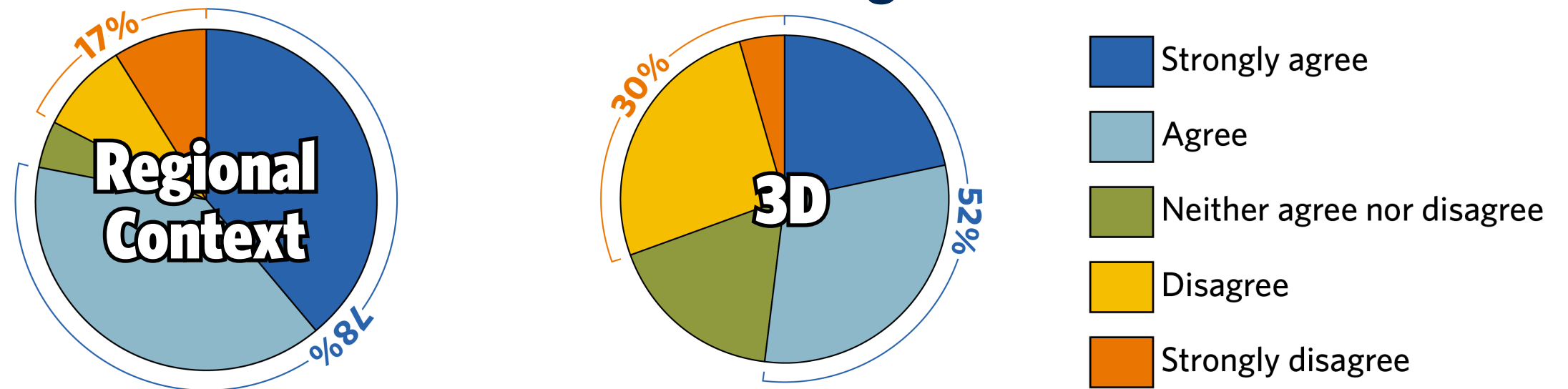
Paper Field Guide with QR Codes



Student's preferred method of field teaching



Does virtual material aid understanding of...?



Guided vs Self-Guided



Feedback on Videos

Introductory Videos

- Good engagement before & after field trip
- Most students find them useful

Usage

Helpful?

Skills Videos

- Poor engagement
- Most students do **not** find them useful and prefer to be taught skills in-person

Usage

Helpful?

Outcrop Videos

- Poor - moderate engagement
- Most students find them useful
- Students dislike watching in the field

Usage

Helpful?

Feedback on 3D Outcrop Models

Mixed engagement depending on the model.

Models used as part of exercises or assessments received significantly more use.

Students don't like using models in the field.

Students find models most useful after the field trip.

Pembrokeshire
usage stats.

Helpful before,
during & after.

Feedback on Interactive Field Guides

Overall, students find field guides very helpful.

Students strongly dislike Google Earth field guides.

Few students made use of QR codes.

Virtual vs paper field guides.

Helpful before, during & after.

What We Learned

Students won't use virtual material unless given a reason to.

Students prefer guided blended learning field trips to self-guided trips.

Students prefer no digital material to digital material which doesn't work well or is poorly made.

Students don't like using virtual material whilst in the field.

If given the chance, students over-rely on the virtual material instead of their own work.

What We Learned

Students won't use virtual material unless given a reason to.

Students prefer guided blended-learning field trips to self-guided trips.

Students prefer no digital material to digital material which doesn't work well or is poorly made.

Students don't like using virtual material whilst in the field.

If given the chance, students over-rely on the virtual material instead of their own work.

What We Learned

Students won't use virtual material unless given a reason to.

Students prefer guided blended learning field trips to self-guided trips.

Students prefer no digital material to digital material which doesn't work well or is poorly made.

Students don't like using virtual material whilst in the field.

If given the chance, students over-rely on the virtual material instead of their own work.

What We Learned

Students won't use virtual material unless given a reason to.

Students prefer guided blended learning field trips to self-guided trips.

Students prefer no digital material to digital material which doesn't work well or is poorly made.

Students don't like using virtual material whilst in the field.

If given the chance, students over-rely on the virtual material instead of their own work.

What We Learned

Students won't use virtual material unless given a reason to.

Students prefer guided blended learning field trips to self-guided trips.

Students prefer no digital material to digital material which doesn't work well or is poorly made.

Students don't like using virtual material whilst in the field.

If given the chance, students over-rely on the virtual material instead of their own work.

Our Recommendations

Create virtual material to serve learning objectives

Make virtual material a core part of field-based exercises

Guide students through field & virtual exercises

Use virtual material to improve accessibility both in and out of the field

Use virtual material to increase amount of field study
students experience

Our Recommendations

Create virtual material to serve learning objectives

Make virtual material a core part of field-based exercises

Guide students through field & virtual exercises

Use virtual material to improve accessibility both in and out of the field

Use virtual material to increase amount of field study students experience

Our Recommendations

Create virtual material to serve learning objectives

Make virtual material a core part of field-based exercises

Guide students through field & virtual exercises

Use virtual material to improve accessibility both in and out of the field

Use virtual material to increase amount of field study students experience

Our Recommendations

Create virtual material to serve learning objectives

Make virtual material a core part of field-based exercises

Guide students through field & virtual exercises

**Use virtual material to improve accessibility
both in and out of the field**

Use virtual material to increase amount of field study
students experience

Our Recommendations

Create virtual material to serve learning objectives

Make virtual material a core part of field-based exercises

Guide students through field & virtual exercises

Use virtual material to improve accessibility both in and out of the field

Use virtual material to increase amount of field study students experience