Supporting Accessibility and Inclusivity in Field-based Education: Development of an Interactive Self-Guided Virtual Tour of a Geological Field School

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Background

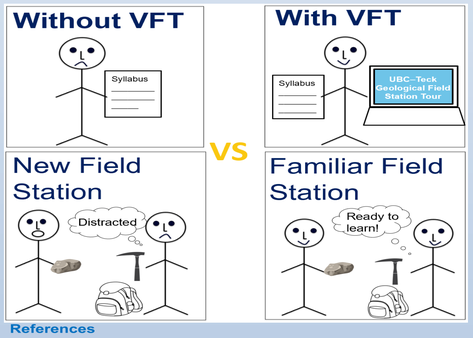
During COVID-19, digital technologies were leveraged to create alternative experiences to address students' needs in geologic field courses (Burmeister et al., 2020). A **virtual field tour (VFT),** which seeks to create a digital version of a student's on-site visit, is a common alternative learning experience provided to students (Carabajal et al., 2017). Little is known about the measured effectiveness of VFTs, or how they can be effectively used to prepare students for learning in field settings. Scaffolding students for field-based learning is critical to reducing learning barriers (e.g., anxiety) associated with 'novelty space' (Orion & Hofstein, 1994).

Guiding Questions

How can we leverage VFTs to better prepare students for learning at a field station by supporting their expectations management and self-assessment of needs?
Can VFT minimize cognitive overload and the negative effects on learning associated with novelty space, thus increasing students' comfort and receptivity to field-based learning?

Hypothesis: Students who are frontloaded with key experience information about the station will feel more prepared and less anxious about embarking on a field-learning experience.

Theoretical Framework



References

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Scene from Virtual Tour of the UBC–Teck Geological Field Station

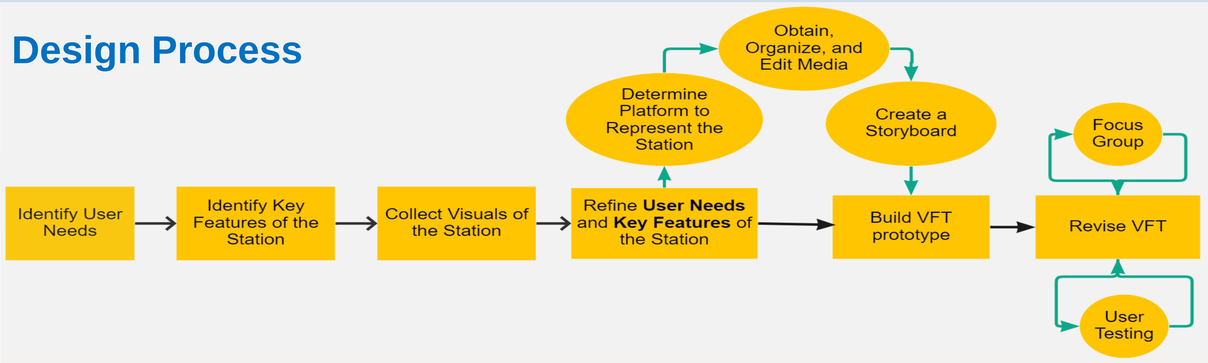
Setting

The new UBC–Teck Geological Field Station opened in April 2022 and is located near Oliver, BC, Canada, the traditional land of the Syilx Okanagan Nation. The station serves as the basecamp for UBC-EOAS's field geology course and now also field courses in conservation studies and forestry

What did we do?

A self-directed interactive VFT was created in Lapentor using 360° images, still images, audio clips, and textual information. This VFT was created as part of the **Earth Science Experiential and Indigenous Learning Project (EaSEIL)** to support student and instructors accessing the station. The VFT was designed as a tool to orient students and help them familiarize themselves with the conditions of the physical space so they can better identify and address potential accommodation needs prior to departure for the station.

Design Process



Preliminary Data

Focus group (n=10): feedback from EaSEIL members on VFT demo provided some insights to inform the hotspot design & navigation options
User testing (n=4): feedback from users, including reported technical issues, was used to improve accessibility features and navigation

Strengths

- Provides alternative exploratory access to station environment for those who can't physically travel to site for pre-visit (e.g., family care, finances, employment)
- Offering immersive interactive navigation w/space increases engagement w/ preparatory field station content
- Self-selected navigation (e.g., choose adventure) increases user engagement
- Way to amplify voices of prior students supporting sense of peer community

Lesson Learned

- Try out several of the virtual tour software and consider maintenance costs and data privacy
- Hot spot design and multimodality elements are critical to user experience (differentiation, density, and location)
- Navigation map elements support users create mental maps of space (spatial reasoning)

Next steps

- Conduct systematic user testing
- Develop an instructor companion guide
- Create a video introducing VFT for users to explore the tour automatically.

Grant funding:

- UBC's Teaching and Learning Enhancement Fund
- UBC Skylight: Science Centre for Learning and Teaching

Acknowledgments:

- Abhideep Singh for contributions to VFT images and selecting technology
- EaSEIL students and leadership team for feedback and user testing