

Leveraging the Power of Reflection and Digital Representation in Middle-Schoolers' Learning During and After an Informal Science Visit

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Background & Project Goals

Informal science learning experiences can greatly contribute to knowledge and interest in science, however, **learners may have difficulty recalling and using scientific information and practices emphasized during these experiences.**

Children acquire knowledge of science cumulatively across formal and informal activities and contexts, highlighting the critical need for informal science institutions **to identify effective practices that support the consolidation of learning and memory from exhibit experiences to foster portable, usable knowledge across contexts.**

This project harnesses the power and potential of visual representations for enhancing learning and seeks to understand how **the use of visual representations can facilitate learners' conversational reflections during an informal science experience - LabVenture - and their subsequent use of knowledge acquired in the informal experience in future contexts,** such as school and the home.

Research Questions

1. Does reflection during an informal science learning experience promote students' retention, and subsequent use of science information and practices that are part of the experience?
2. Does interpreting and constructing visual representations, such as drawings, improve students' understanding and retention of information, and if so, how and when?
3. Does combining visual representations and narrative reflections confer benefits on students' science learning and engagement in science practices both during the informal learning experience, and later in their classrooms and at home?

Acknowledgements



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The project team would like to thank the LabVenture educator team and the Upswell design team for their support and contribution to this work, and the teachers and students who daily fill the halls of GMRI with their enthusiasm and curiosity.

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Focal Informal Learning Environment: LabVenture

LabVenture is a 2.5 hour inquiry-based informal science learning experience **annually serving 70% of Maine's 5th and 6th graders, ~9,000 students,** at no cost to schools. The experience combines data collection, visualization and interpretation, and narrative reflection to support learning about key changes in the Gulf of Maine ecosystem due to climate change.



Combining Data Collection, Visual Representations & Narrative Reflection to Foster Learning about Climate Change



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Acknowledgements



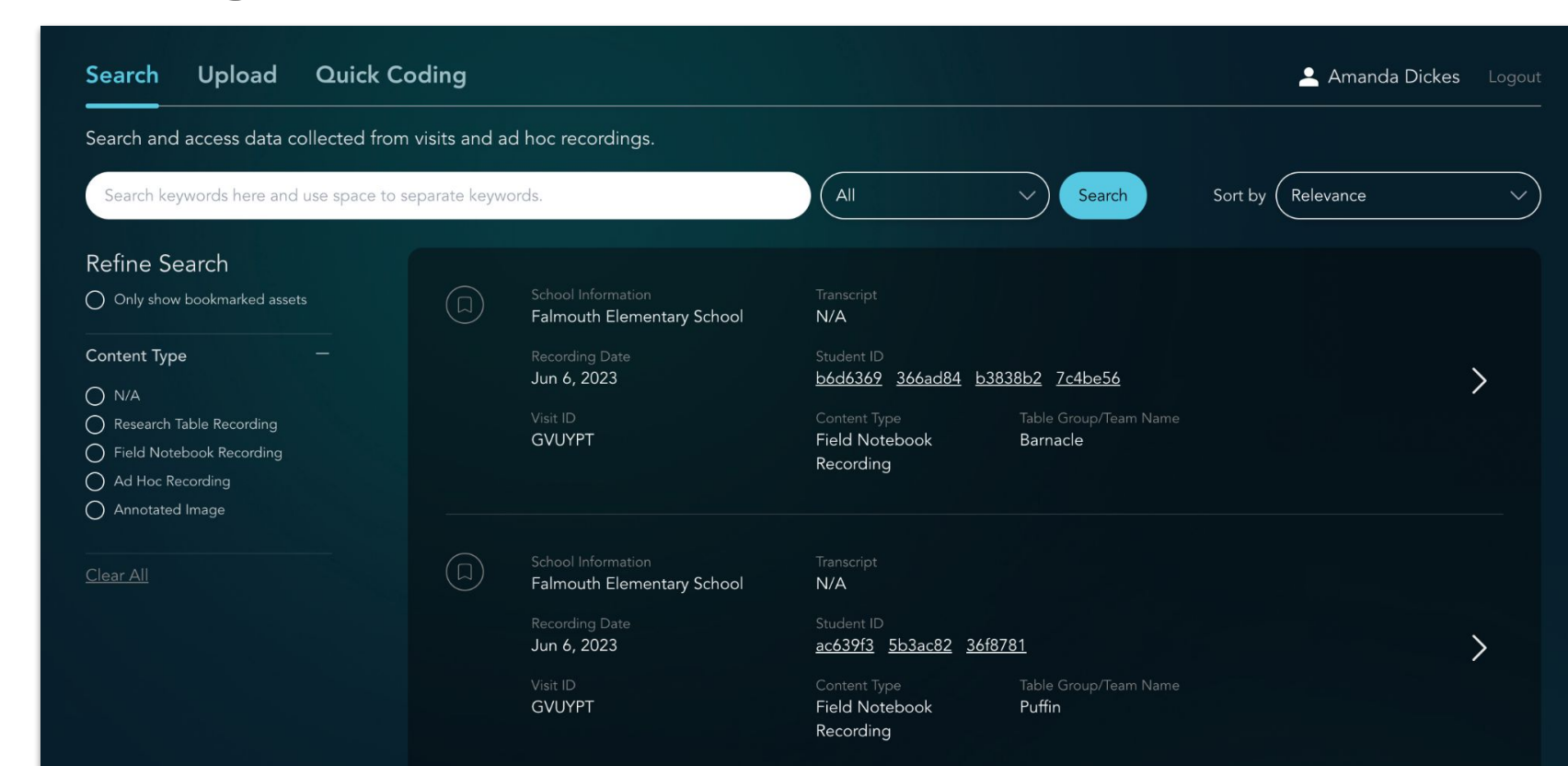
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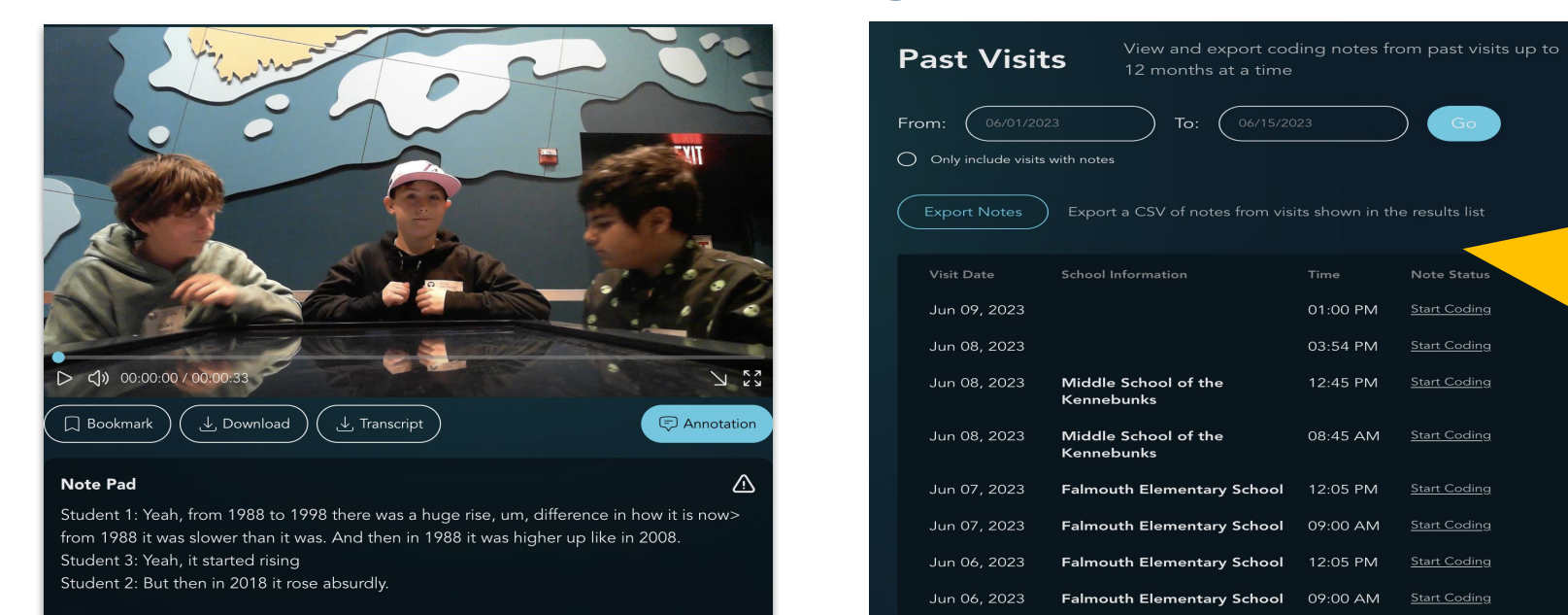
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Connecting Learning across LabVenture, School, and Beyond

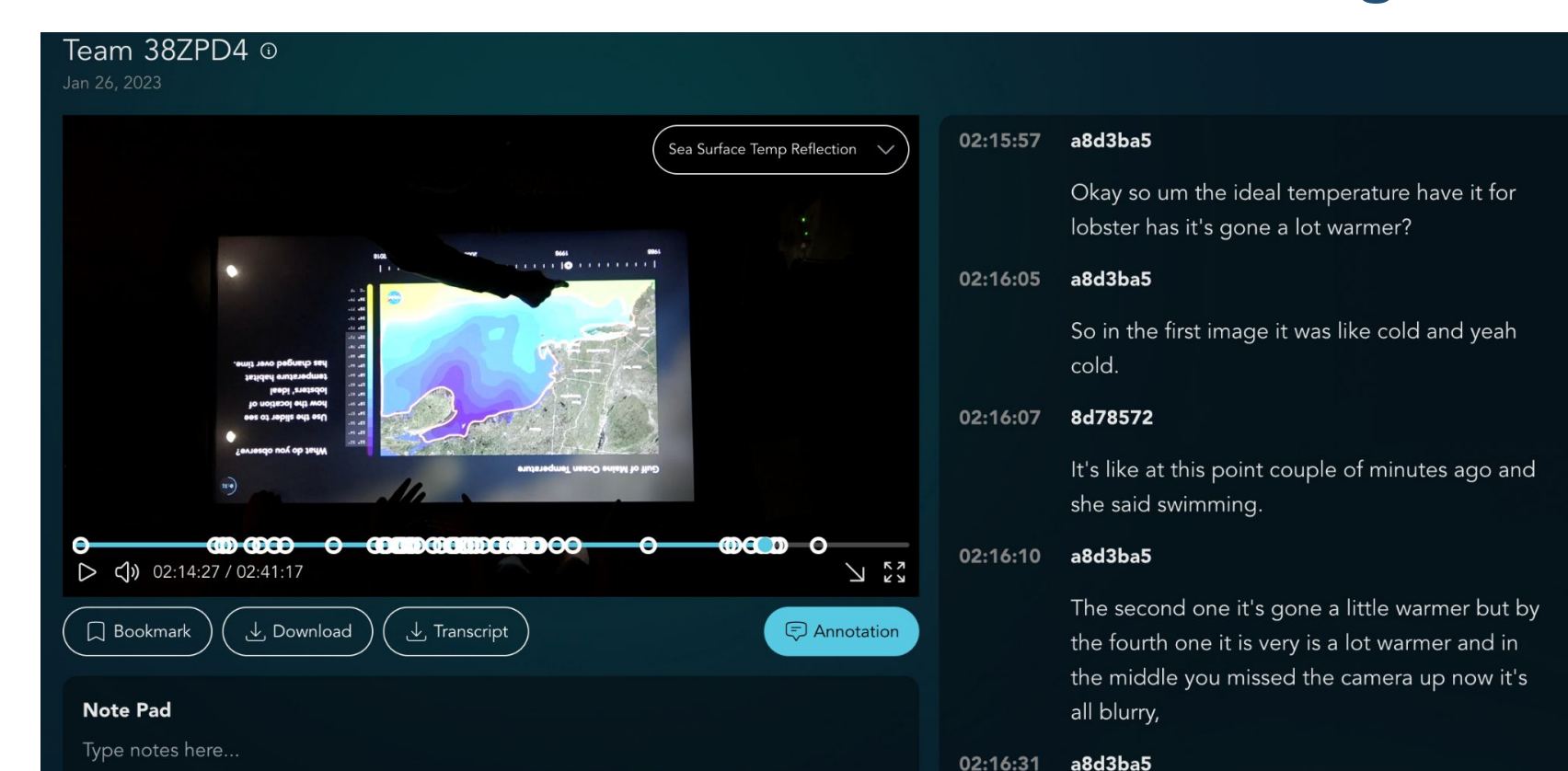
Building infrastructure to conduct research at scale



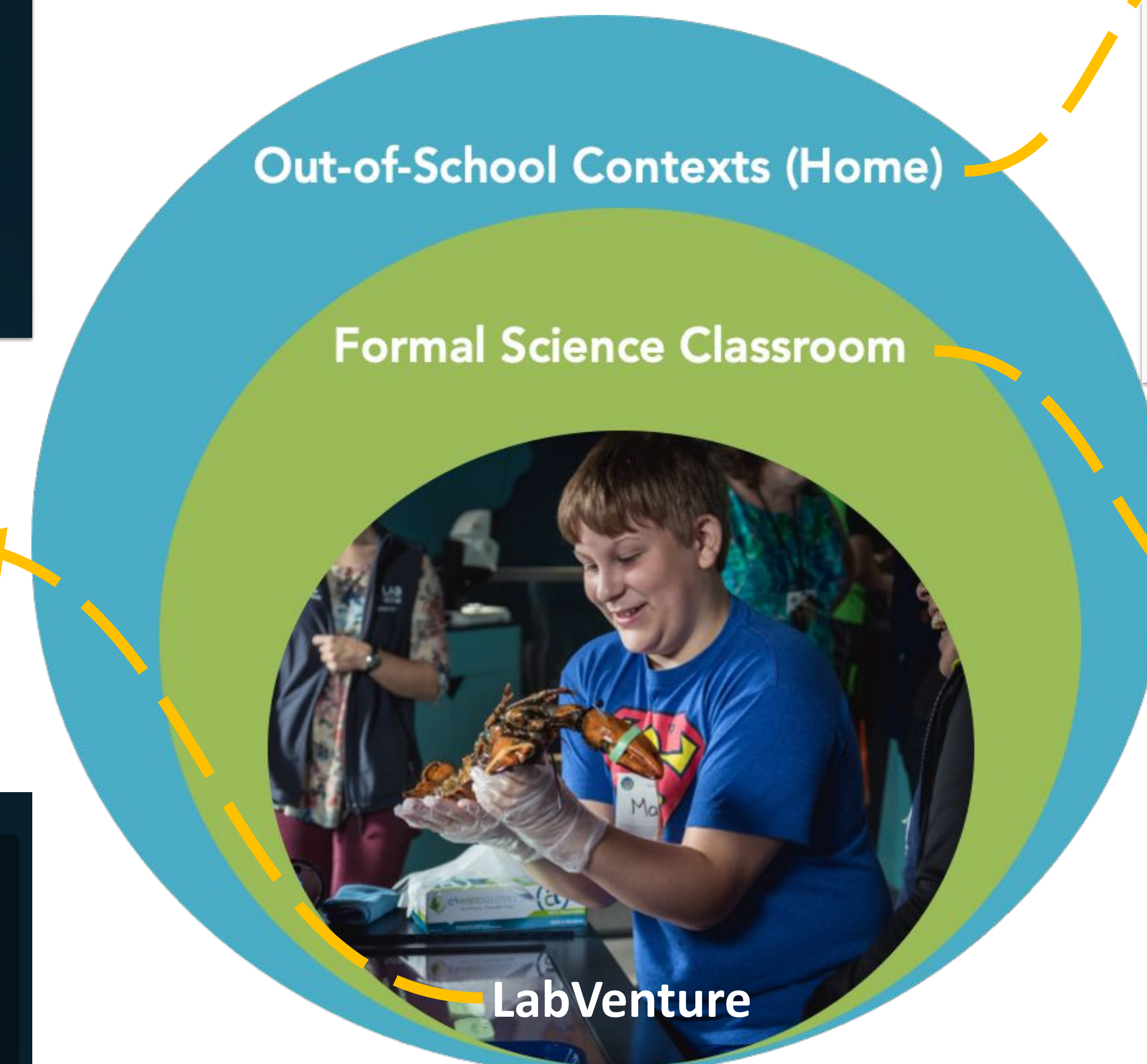
Research Dashboard organizes data assets collected during LabVenture



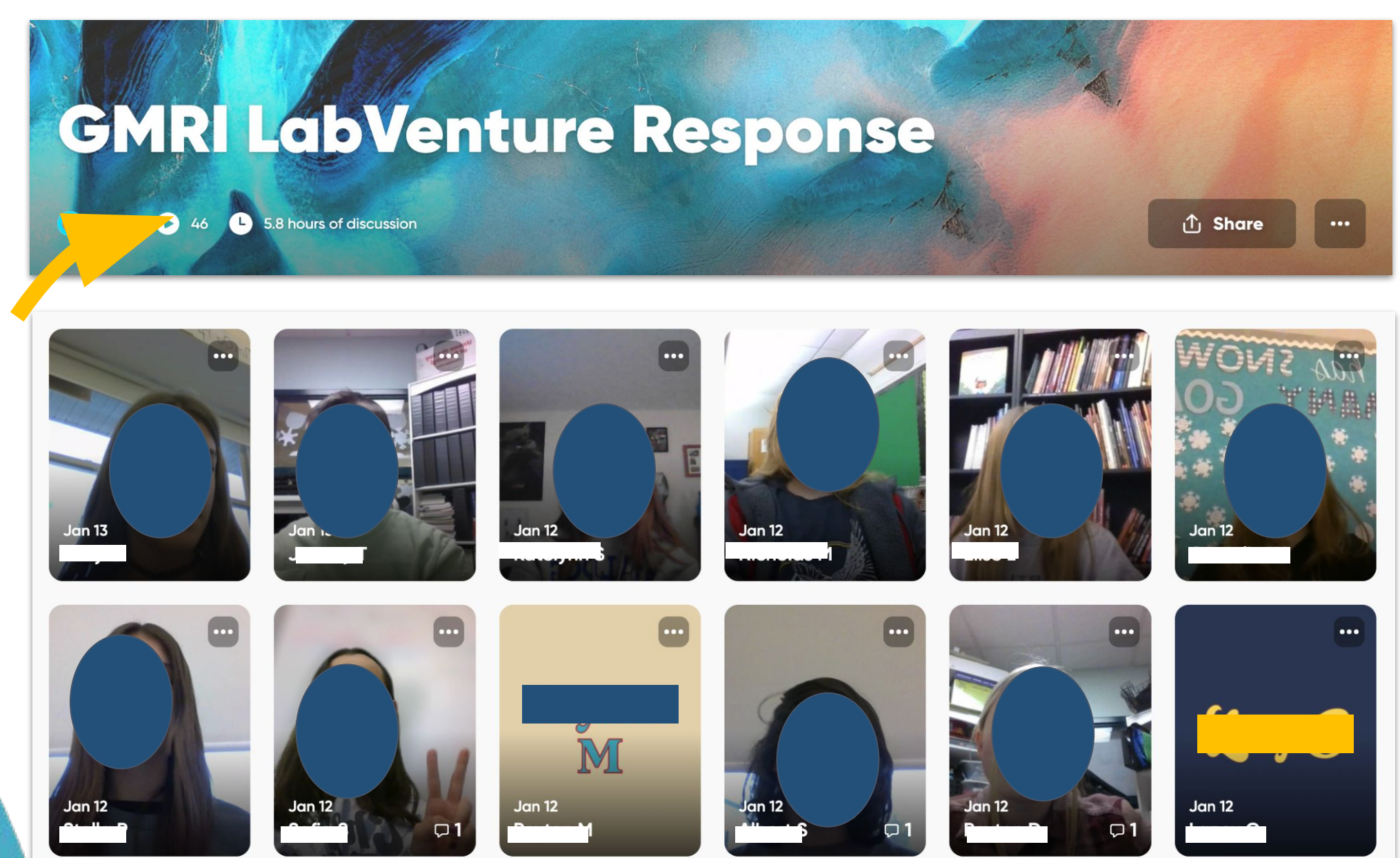
Narrative reflections & Quick Coding



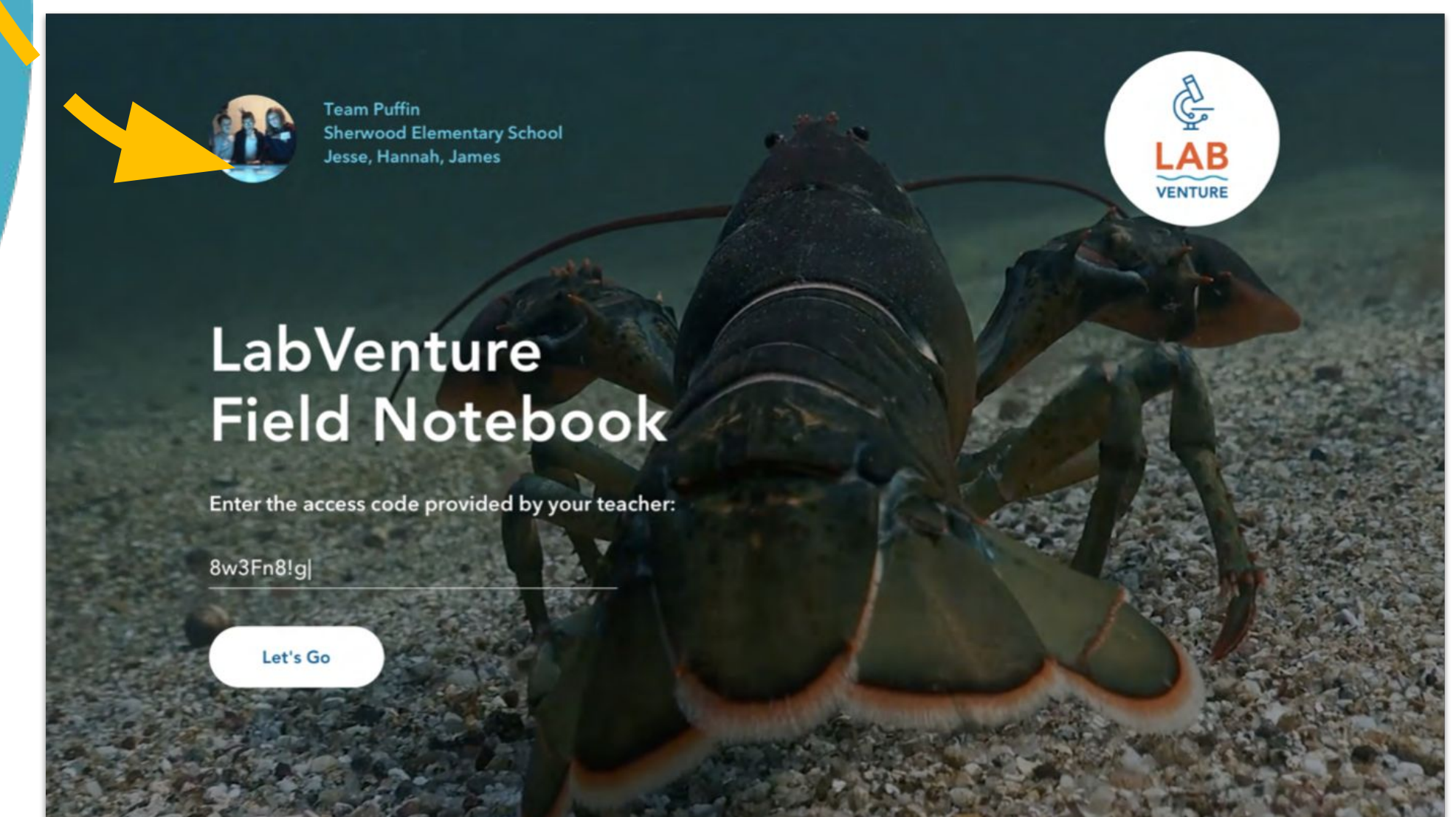
Overhead video of touch table and transcription of student talk



Investigating the portability of science knowledge acquired during LabVenture into school and beyond the classroom



Post-LabVenture video reflections recorded by students and uploaded to the Flip! video sharing platform



Digital companion classroom lessons re-introduce familiar visual representations, support construction of novel visual representations, and provide opportunities to refine reflection responses