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## Collaborative Research: Learning to Observe: Unpacking Teachers Development of Expertise in Scientific Observation

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## ***Data Management Plan***

***Title:*** Collaborative Research: Learning to observe: Unpacking teachers' development of expertise in geological observation

PI: Dr. Lauren Barth-Cohen, University of Utah

The proposed project is a collaborative research project and will be carried out by the University of Utah's College of Education and Natural History Museum of Utah and Utah State University. The field portion of the project will occur at Utah Valley Universities (UVU) Field Station in Capitol Reef National Park.

### ***Types of Data, Data Storage, and Provisions for Appropriate Protection and Privacy***

The proposed project will gather data in the form of a background data survey for teachers. During stage one (the synchronous online course), we will audio and video record all sessions and collect any teacher-produced drawings or other artifacts completed in collaborative virtual documents, and researcher field notes. Automatic transcripts and "chat" transcripts will also be collected. We will also collect ethnographic field notes. During stage two (the summer field experience), we will ask everyone (teachers and instructors) to wear or carry mini digital voice recorders to allow for the collection of audio data during field observations. Photos will be taken at each field site to record the geology under investigation and the objects of focus (e.g., outcroppings, individual rocks) of teachers' conversations. We will also collect audio and video recordings and photos from community building activities, evening guest speakers, and any additional structured activities that occur at the UVU field station. Additionally, we will collect written work from teachers throughout the week, including teachers' notes and final stratigraphic columns will also be collected. The research team will also record ethnographic field notes throughout the field experience.

Finally, in stage three, this data will include video and audio recordings and teacher artifacts from the practicum, teachers' small group collaborative sessions. We will collect teachers' lesson plans and other planning documents as related to the new field-based learning experiences that the teachers develop for their secondary science students in their home communities. We will also collect audio and video record all sessions and collect any teacher-produced drawings or other artifacts completed in collaborative virtual documents, and researcher field notes. Automatic transcripts and "chat" transcripts will also be collected. Additionally, the research team will visit and observe a selected number of those new field-based learning experiences and collect audio data and student written work of the high schools in field-based settings using a similar method with the mini digital voice recorders that was used in stage two. This data collection will continue into the fall of the third year of the project, when Year 1 teachers serve as mentors for Year 2 teachers in the practicum (Stage 3 of the PLE).

All data will be maintained on secure encrypted digital media that are password protected. Researchers will produce captioned, annotated video recordings of selected videos, which will be stored on a dual-authentication, password-protected online server. Subjects appearing in video and audio files will be assigned an anonymous identifier that will be used in presentations and publications referring to that subject, and the key will be stored separately from the data itself. Condensed segments of the data may be included in peer-reviewed papers and presentations (e.g., quotations from individuals who participated in the discussions, still camera shots, or short audio/video clips). In all of these instances, only participants who have provided permission will be included in audio and video. Additionally, all teachers will be referred to by pseudonyms, and identifiable information will be removed from audio. All quantitative data

will be linked only to participants' pseudonyms. A pseudonym key will be stored in a separate file from this dataset.

When not being used, all external hard drives will be stored in locked cabinets in the PI's or Co-PI's offices. All of the data will remain permanently accessible to project personnel and researchers (by permission).

### ***Policies for Access and Sharing***

The University of Utah will encourage and facilitate the prompt sharing with other researchers, at no cost, of data gathered in the course of the work under this grant. The identity of all participants will be protected according to protocols established by the Institutional Review Board (IRB) of the University of Utah. At the heart of any IRB protocol is the informed consent of participants and that participants' identities are not revealed. As a general rule, the identity of participants will not be part of our reports and will not be shared outside the organization. Data from participants who have not consented will be eliminated from the study. Access will not terminate at the end of the funded project. All of the data will remain permanently accessible to project personnel and researchers (by permission) through external hard drives and encrypted digital media.

This project will produce peer-reviewed papers and presentations at national meetings (e.g., the American Educational Research Association, National Association of Research in Science Teaching, International Society of the Learning Sciences) all of which will be available to other researchers and the public in accordance with typical professional standards. Additionally, the project will produce curriculum materials that will be available freely online.

### ***Policies and Provisions for Re-use and Re-distribution***

Researchers will be granted access to all *original* data generated by the project providing: (1) such access is consistent with the terms of the IRB plan for this project, (2) the researchers provide a plan to protect the identity of all participants in subsequent publications, (3) the researchers provide a Data Management Plan that is consistent with this one, (4) the researchers do not share these data with other researchers or groups without the permission of the University of Utah, and (5) the researchers are qualified to undertake research on these data based on their qualifications and prior work. The decision to grant or deny access will be made in writing by the Associate Dean for Faculty Research in the College of Education at the University of Utah.

### ***Plans for Archiving Data***

All of the data will remain permanently accessible to project personnel and researchers (by permission) through external hard drives and encrypted digital media.