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Collaborative Research: Supporting Rural Paraprofessional Educators and their Students with Computer Science Professional Learning and Expansively Framed Curriculum

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***Collaborative Research: Supporting Rural Paraprofessional Educators and their Students
with Computer Science Professional Learning and Expansively Framed Curriculum***

DATA MANAGEMENT PLAN

Our plan for data management will conform to the NSF policy on the dissemination and sharing of research results. The purpose of this plan is to ensure the integrity and vitality of the data collected, to protect the rights of our research subjects in accordance with the privacy policies and institutional review board criteria under which this work is conducted, and to ensure that research data can be shared appropriately and disseminated as widely as possible. For the purposes of this data management plan, we will discuss data that is collected from paraprofessionals, teachers, and students in detail below. Over the duration of the project, we will report on results as they become available in academic conferences and journals.

I. Types of data generated.

The project will collect data from participating paraprofessionals, teachers, and their students. From paraprofessionals and teachers, the project will collect demographic data, videotaped observations of professional learning sessions, lesson plans, fieldnotes of class lessons, and artifacts from the professional learning, videotaped observations of paraprofessionals' and teachers' lessons, and interviews. From students, we will collect data from pre- and post-affect surveys, Student Engagement Exit Tickets during the unit, and digital artifacts of student Scratch projects.

Survey responses will be entered and stored in a common spreadsheet format (e.g., .xlsx) and then analyzed using quantitative and qualitative processing software (e.g., R and MaxQDA). The videotaped observations will be filmed using a digital camcorder and stored electronically as video files (e.g., .mp4). Video data will be stored on a secure third party hosting site such as Box. Video will be transcribed, and transcripts will be reviewed. Once transcripts are approved, all personally identifying information will be removed.

Those videos will only be analyzed in secure locations by project personnel, although some brief excerpts may be presented in formal research presentations where norms related to respecting confidentiality are well established.

II. Standards for data and metadata format and content.

Data will be stored in commonly-used file formats (e.g., .mp3 for audio files, .mov for screen recordings, .docx for text documents). On occasion when proprietary data analysis software is used, such as may be the case with qualitative data software, the format that is used within that software will also be used.

III. Policies for access and sharing.

The data will be hosted securely in accordance with existing approved human subjects protocols using USU's Box platform. All connections are ssl encrypted between client and host as well as between servers. Personally identifiable information will be encrypted.

For research data collected via online methods, such as surveys, data will be submitted to a secure web server. These data will be matched to the ID and any identifying information removed.

All data will be stored using only ID numbers in order to maintain confidentiality. Electronic files will be password-protected. Data collected in hard copy form will be stored in locked filing cabinets in locked offices at USU.

Within the Research Team, data will be shared via a central repository for projects, field notes, videos and transcripts so that the proposed data analyses can be consistently coordinated.

Research updates will be circulated regularly among project members. No data with direct subject identifiers will be released outside of the research team.

Research activities that involve human subjects will be submitted for approval to USU's Institutional Review Board (IRB). The USU IRB is AAHRPP accredited.

The PIs will ensure that shared and disseminated project work complies with IRB determinations and approvals when the work involves data collected from human research participants.

IV. Policies and provisions for reuse, redistribution, and the production of derivatives.

Project data will be made available, upon request, to other researchers after initial publication of the project's findings. Data sharing will be in aggregate views. When sharing any human subject data, we will remove from the dataset any identifier that could compromise the confidentiality and anonymity of a participant. Data files will be transferred electronically via a secure file-sharing protocol. Coding documents that specify the fields of data files will be created to accompany each type of data file to ensure that the data files are meaningful to other investigators. Some carefully curated, brief excerpts (less than 5 minutes) of project video data may be shown in research presentations as necessary, but only in settings where the research norms of confidentiality are observed.

V. Plans for archiving and preservation of access.

Utah State University, through the Merrill-Cazier Library, provides institutional repository services through the bepress Digital Commons platform. DigitalCommons@USU supports all file types and formats. Files are provided with persistent URLs, and if needed, Library staff can obtain DOIs for datasets. The system is able to produce license and copyright statement, as needed, and creates standard citations. All files are backed up at multiple sites, including cloud storage. Preservation copies are stored in Amazon Web Services, with redundant storage across multiple facilities and are regularly verified for integrity of data using checksums.

Because video will involve minors, those records will not be archived. Quantitative data sets will be made available through the USU institutional repository services within 2 years following grant completion or after final publications have been submitted, whichever is later. Anonymized transcript and field note data will be retained indefinitely by the PIs but stored on departmental servers so as to reduce the risk of accidental disclosure of information that may be re-identified. Those anonymized qualitative data will be made accessible to third parties for subsequent review as requested for scientific integrity.

VI. Dissemination of data and results.

Portions of qualitative data, which may appear as transcript excerpts and portions of field notes, and quantitative results, will be presented and published during dissemination of research consistent with the norms of research publishing. These will appear in conference presentations at venues such as the *Annual Meeting of the American Educational Research Association*, *School Science and Mathematics Annual Conference*, the *International Conference of the Learning Sciences*, *SIG Computer Science Education (SIGCSE)*, *International Computing Education Research (ICER)*, and the *Annual SIGCHI Conference (CHI)*. Most of these conferences include published conference proceedings. With conference proceedings and journal publications, faces of participants will be edited or blurred so that participants are not identifiable and will be referenced using pseudonyms. Journal publications will be targeted toward venues such as *Journal of the Learning Sciences*, *Elementary School Journal*, and *ACM Transactions on Computing Education*. Some images obtained from video and brief video clips that have been deidentified may be used in research presentations or for the annual *NSF STEM for All* video showcase. For research presentations, such as lectures or talks, secondary video recording of presentations will not be permitted so as to reduce risk of participant identification. Our publications will ensure that resulting knowledge, design guidelines, and lessons learned are disseminated to a broad and multidisciplinary audience.