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# Developing board games and learning materials to support 5th grade students' connected learning around computational thinking and coding

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**DATA MANAGEMENT PLAN**

### 1. Types of Data Generated

- The proposed study collects the following three types of data: (1) transcripts and audio or video recordings of clinical interviews, interviews, focus groups, and game sessions; (2) surveys characterizing participant interest. (3). Observation notes of the game play. Audio and Video will be transcribed, and transcripts will be reviewed. Once transcripts are approved, all personally identifying information will be removed.

- Subsequent analyses will occur, using transcripts labeled with unique numeric identifiers. For each student, all data will be tied together using a unique identifier, and identifying information of participants will be removed immediately following data collection. The file in which participant names and unique identifiers are kept will be maintained separately from other data and accessible only to the PI. All research will be conducted on data with unique identifiers and personal information removed when possible, although video analysis does involve information that is inherently identifiable. 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.

### 2. Standards to be used for Data and Metadata Format and Content

- Common file formats for text, audio, and video will be used including .txt, .rtf., .docx, .pdf, .mp3, .aac., .wav, .m4v, .mov. 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.

### 3. Policies and Procedures 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.

**4. Provisions for Re-Use, Re-Distribution and Production of Derivatives**

De-identified qualitative data will be made available to other researchers to analyze 2 years after the end of the grant or after publications have been submitted (if before 2 years) upon written request. Quantitative data will be made available 2 years after the end of the grant or after publications have been submitted in a public archive. Some carefully curated, brief excerpts (less then 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.

**5. Plans for Archiving Data**

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.

**6. Dissemination of Research With Data Included**

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*, 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* 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.