

6-7-2018

Elementary STEM Teaching Integrating Technology and Computing Holistically

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Recommended Citation

Tofel-Grehl, Colby, "Elementary STEM Teaching Integrating Technology and Computing Holistically" (2018). *Funded Research Records*. Paper 70.

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Data Management Plan

The following is the plan we have developed to maintain the integrity, security, access and organization of the data collection and storage during the course of the proposed research project.

Data description: The data that will be collected for this project will be a combination of quantitative and qualitative information gathered from human subjects. A variety of cognitive, affective, and developmental data will be collected using a combination of extant instruments, newly developed instruments, interviews, observations, and Internet correspondence.

Metadata: The metadata we are likely to use will be extracted from the Utah State Office of Education, which may include accessing publically available data such as aggregate student tracking system data and therefore, will be stripped of identifiers prior to our access and use.

Existing data: We will rely on state and federal government data as well as data from organizations such as Change the Equation, for STEM education and workforce data.

Data organization: For the project Colby Tofel-Grehl (PI) will be responsible for managing the data collection, maintaining the storage of the data, and assuring it is secure. Data will be named according to the source of the data, the nature of the data, and the date the data were collected. This is similar to the procedure that the researchers currently use in conducting their research. The data will be stored on password protected office computers, personal portable USB storage devices or in the University's highly secure Tofel-Grehl_dataure, cloud-based environment using Box <https://www.box.com/home/b/>. Paper versions of data will be stored in PI/Co-PI offices in their locked file cabinets. The procedures they use are in compliance with the Utah State University of Sponsored Programs, Office of Research Compliance and acceptable for satisfying the oversight by the campus Institutional Review Board.

Quality Assurance: All data will be collected and maintained to assure continuity and integrity of the information. We will follow the protocols submitted with our IRB applications and adhere to the standards consistent with quality research.

Responsibility: Colby Tofel-Grehl, Kimberly Lott, and Kristin Searle will all be involved in the collection of data. However, responsibility for data management and storage will reside solely with the PI in order to ensure security and privacy guidelines are followed. Our evaluators will be responsible for collecting the evaluation data for the program and will do so under the Utah State IRB.

Audience: We will use the data we collect to draft manuscripts and reports which will be shared at the annual NSF conferences (regional and national), AERA, NARST, NSTA, ASTE, and the associated (or related) peer review publications.

Data Sharing: As described above, we will leverage the resources and infrastructure of Box, available to researchers at Utah State University, to store and share data. We will share our data in a form that is readily accessible (PDF) and in a state that will allow others to replicate our findings. Data sets may be conditioned to assure protection of our human subjects.