

2016

Data Management Plan for Preparing Secondary Mathematics Teachers with Video Cases of Students' Functional Reasoning

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DATA MANAGEMENT PLAN

Types of Data Produced

Several types of observational and survey data will be gathered and analyzed. Approximations of each are listed below:

- **Secondary student interviews.** 40 interviews with middle and high school students conducted prior to proposal that will be analyzed and used to create module materials.
- **Prospective secondary mathematics teacher (PSMT) interview data:** 12 videos and resulting transcripts, and hand written artifacts produced during the interviews in year 1.
- **Instructor Interview data:** 9 videos with transcripts, and interviewer field notes in years 2 and 3.
- **Classroom observation data:** 64 videos and resulting transcripts, and observer field notes.
- **Instructor journal notes:** 2 sets of instructors' written reflections on module implementation in years 1 and 2.
- **Instructor feedback form responses:** 14 completed forms, consisting of instructors' written reflections on module implementation in years 3 and 4.
- **PSMTs' module responses:** 240 sets of answers PSMTs submitted to selected response and open-ended questions in each unit of module in years 1-4.
- **PSMT pre/post measures:** 225 sets of selected responses provided by PSMTs to the pre/post module measures in years 2-4.
- **PSMT-FR module survey data:** 225 sets of written and selected responses provided by PSMTs to the post module surveys in years 2-4.
- **Module response rubrics:** Coding schemes used to analyze PSMTs' module responses will be updated each year for a total of approximately 40 rubrics each year.
- **PSMT artifact coding schemes:** Coding schemes used to analyze PSMT interviews and classroom artifacts will be updated in years 1-3.
- **Coding tools for collective activity.** Argumentation logs and mathematical ideas charts will be created for each classroom follow-up session in years 1-3 for a total of approximately 24 logs and charts.

Data and Metadata Standards

Videos will be collected using an iPhone6 and downloaded in .mov format. Transcripts of the videos will be created in Microsoft Word and stored as .docx files. Field notes and instructor feedback will be transferred to a Word file and stored as a .docx files. Survey and module responses will be gathered using Google forms and then downloaded as Excel spreadsheets and stored as .xlsx files. Hand written artifacts will be retained in their original format. A separate coding system documenting the theory represented in the document will be created in an Excel spreadsheet and stored as a .xlsx file. Each file will be named using a consistent and descriptive naming convention.

In consultation with Boise State's Albertsons Library Scholarly Communications and Data Management unit, L. Cavey will oversee the organization and management of the various data files, and will be responsible for establishing and maintaining a consistent file naming and organizational structure. Additionally a descriptive, "ReadMe.txt" metadata file will be created and stored with the raw data and will include: document title, author name, software or tool utilized, and a general document description. Where appropriate, additional codebooks and variable-level metadata will be created and stored with the related files.

Policies for Access and Sharing

Much of the data collected during the grant project will include personally identifiable information and the specific nature of the student and teacher activities being studied will make it difficult to maintain anonymity if the data were publicly shared. Therefore, access to all data files and related research

materials will be limited to the PIs and identified project staff. Other Boise State or external researchers will be able to contact the PIs and request access utilizing the protocol described in the *Policies and Provisions for Re-Use and Re-Distribution* section. If shared, ownership of the data will remain with the PIs unless otherwise indicated during the permission granting process. De-identified and anonymized data and analyses of research results will be published in peer-reviewed journals, practitioner publications, and conference proceedings. Selected videos of middle and high school students (from student interviews conducted prior to the grant period) will be de-identified but included in the vide-based online learning module.

Policies for re-use, redistribution

Whether based at Boise State or external to the university, any researcher wishing to access or use the project data will be required to submit to the PI a permission request via email or printed letter. Researchers will need to note which files they would like to use, how they would like to use them, and if there will be any derivative materials created or published works generated based on the data. Researchers granted access will be required to comply with any confidentiality conditions or other assurances provided during the original IRB application.

Plans for archiving and preservation

During the active project period, files will be stored on a shared networked drive managed by the Boise State's Office of Information Technology (OIT). OIT's research storage facility is Access Control List protected on high availability NAS and SAN devices hosted on secured networks accessed by users and applications via CIFS (SMB), NFS or iSCSI protocols as appropriate. OIT is responsible for daily backups and for managing the dedicated disaster recovery facilities housed off site.

All data and related research materials will be retained for 5 years past the completion of the grant. At the end of the post-grant 5 year period, the PI will work with the Scholarly Communication and Data Management unit to determine if further archiving is needed, ways to convert proprietary files to non-proprietary formats, and if it is possible to anonymize and make the data publicly available at that point. If it is determined that the data can be publicly shared, the data and research material files will be converted into non-proprietary formats and archived in an appropriate, trusted repository. Once archived, an associated metadata record will be created in ScholarWorks, Boise State's institutional repository in order to facilitate discovery and citation of the materials.

Access will be managed by the PI in accordance with the guidelines and process detailed in the *Access and Sharing Policies and Policies and Provisions for Re-Use and Re-Distribution* sections. If the PIs are unable to continue to manage access to the materials, other project management team members or the department chair will assume these duties.

Raw data used to support any published research will be reviewed for possible anonymization and archiving either through an appropriate disciplinary repository, ScholarWorks, or the journal publisher's website.