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# Collaborative Research: EHR Core: Exploring the Emotional and Motivational Lives of Undergraduate Engineering Students

Idalis Villanueva  
idalis.villanueva@usu.edu

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## **Data Management Plan**

The following data management plan describes the manner by which expected data, metadata, and secondary products will be generated and how these products will be managed. The Baseline, Study 1, Study 2, and Study 3 data will be collected by Dr. Villanueva and Dr. Husman and the graduate student hired for this project. Although the consultants will be involved in important aspects of the project, they will not be collecting data although discussions about results and data analysis may take place.

Intellectual property and data generated under this project will be administered in accordance with the Utah State University, University of Oregon, and NSF Data Management Guidelines. The objective of the data management plan is to maximize data access for researchers, collaborators, and the public; now and in the future. Human subjects' data will be stored in an encrypted BOX database in a server on the Utah State University campus, and will be made available upon request in formats that insure anonymity of the participants.

### ***Roles and responsibilities***

The PI ensures the implementation of the data management plan at each reporting period and that the Co-PI's are fulfilling their responsibility. The PI is also the public contact for providing access to data upon request via email.

### ***Expected data***

The expected data from the proposed research originates from survey research with human subjects, biological samples, psychological measures all findings from this project will be reported as aggregate data and anonymity will be ensured in all forms for presentation or publication. All human subject data will be handled in accordance with the Internal Review board requirements and recommendations.

All biological samples will be processed and stored at the Universität Trier in Germany in the Biology and Clinical Psychology Trier laboratory (<https://www.uni-trier.de/index.php?id=5678>). Dr. Pekrun and his assistant will abide to Institutional Review Board protocols. All samples sent to the Trier Lab will be double-coded and anonymized before processing. Results will be sent to the PI via encrypted email.

### ***Data formats and metadata***

Human Subjects data will be stored in an BOX database, unique study IDs will be created for each participant, personally identifying information will not be maintained in this database.

### ***Period of data retention***

No specific limit is set at this time for the length of data retention. The data will be kept for at least the duration of the project plus at least three years. However, the data base is extensible and there is sufficient storage space for many decades' worth of data. The raw experimental and statistical data are saved on BOX database and on a virtual server. The backup of the data repositories is managed by the USU IT department, which incorporates multiple levels of redundancy.

***Data dissemination and policies for public access, sharing and publication delays***

The PIs will share the results of the activity with other researchers within a reasonable time in order to conform to the NSF policy on dissemination and sharing of research results. The public release of data will be at the earliest reasonable time. The main venues for data dissemination will be the disclosure of results to the scientific community through presentations in disciplinary scientific meetings, with subsequent long-term standard publication of scientific results in: (a) peer reviewed publications and (b) academic theses both of which will be accessible to the public. To ensure the quality of the data, the PI's plan to release any and all data only after the peer review process. Journals increasingly allow the upload of supplementary information and where ever possible the data used to generate graphs and tables in publications will be uploaded to the publisher's website so that it is immediately available to the reader.

***Data storage and preservation of access.***

Data is stored on a virtual server managed by USU technical services who are responsible for maintaining the multiple redundant backups.

***Commercial Sensitivity***

Any research that produces data that may produce security or privacy concerns will be reviewed by the USU research office to ensure proper safety. With regard to intellectual property issues, USU will follow the guidance of USU Intellectual Property which is the exclusive intellectual and property management and technology transfer organization for USU.