

NSF Data Management Plan

Types of Data and Materials Produced in the Project

- Student demographic data on gender, major, grades, and ethnicity in each course will be collected by the corresponding course instructor with the IRB approval.
- Assessment data on learning outcomes, generated based on student's grade distribution, teachers training, project surveys, project reports, conference and journal coauthored papers will be created in the project database.
- Learner profile data will be stored in the Learning Record Stores (LRS) on the two local servers of Embry-Riddle Aeronautical University (ERAU): one mirrored to another.
- Experimental data; generated based on biology or ecology experiments and other the learning systems.
- Software data; such as Python, C, and MATLAB files used to verify real time data with the experiment data
- The proposed educational activities are expected to result in instructional data: lecture notes, lecture videos, handouts, homework/exam problems, and class projects. These will be made publicly available through HTML file format.

Data and Metadata Standards

Student demographic data, project assessment data and scientific research data will be stored in Google Drive and Dropbox and be converted to any standard format with appropriate authorization and password protection.

Policies for access and sharing data

The produced data will be released to any researcher's request based on the terms of the funding except human data with confidential and privacy information. The release date will be a year after obtaining the data to allow time for the PI to refine the data quality, publish findings and disseminate research results. The PI will promptly prepare and submit data and results for publications, with authorship that accurately reflects the contributions of those involved, all significant findings from work conducted under the NSF grant. The primary data, samples, physical collections and other supporting materials created or gathered in the course of work under the NSF grant will be made public for the benefit of the research community. There will be no additional restrictions, charges, or permissions required for accessing the data.

Dissemination of Materials and Reports

- Submittal of assessment data and student demographic data to NSF in annual report.
- Report on gps2dreamcollege.com website to share with mentors, students, teachers, and school district specialists within the program period and open for the scientific community for the long run
- The original data creators would retain the rights to use of data prior to allowing access for wider use per established institutional policies of the ERAU, plus the ERAU IRB. Privileged or confidential information will be released only in a form that protects the privacy of individuals and subjects involved. Data items produced by the project may be subject to copyright on an individual basis, per established ERAU institutional policies.
- Presentation of project methods and results at professional conferences and academic journals.
- To ensure timely dissemination of research results to as many researchers as possible, the PIs will also use arxiv.org to make pre-prints of all conference and journal submissions available. An acknowledgment of the source of the data and the funding agency (NSF) will be required.

Policies and provisions for re-use, re-distribution

We will adhere to all NSF, national, and state policies including NSF and Embry-Riddle Aeronautical University policies regarding access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements; policies and provisions for re-use, re-distribution, and the production of derivatives. Copyright and other intellectual property owners will be dictated by the funding source for the work.

Research at the involving human participants is carried out under the oversight of the Institutional Review Board (ERAU IRB). This research protocol will be reviewed and approved by the IRB before any data is collected. Provisions for appropriate protection of privacy, confidentiality, security, intellectual property, and/ or other rights or requirements will be overseen by the ERAU IRB compliance evaluation assessment. Ethical and privacy issues will be addressed and monitored respectively by these entities. Interview tapes will be transcribed and after they are transcribed erased. We will also ask all members of group interviews to maintain the confidentiality of what is stated by others. All participants will have signed informed consent which outlines the research they are involved with and other information according to the U.S. Office for Human Research Protections (OHRP) and Code of Federal Regulations (CFR) before they participate in the study. Similar Data involving personal information collected at other 10 partner institutions will go through their own IRB compliance evaluation and review or approval.

Plans for archiving and Preservation of access

All data and project artifacts will be zipped and stored in secure computers on Embry-Riddle Aeronautical University at Daytona Beach following ERAU guidelines and policies. The dataset will also be archived on internal backup servers for possible later uses. All test notes, analysis, papers and reports associated with a dataset will be stored with it. The longterm data storage device will be a backup system. Because the project involve data-intensive reearrch, the description include more details data collection and retrieve plan.

Data Management Responsibility

- The PI Liu at ERAU is responsible for storing information about the project participants, pre and post test data and project created works and publications at ERAU. He will also manage any data pertaining to the project website.
- The PI Spector at University of North Texas (UNT) will be responsible for storing data about project participants at UNT.
- The PI Wolyniak at Hampden-Sydney College (HSC) will be responsible for storing data about project participants at HSC.
- The PI Yedjou at Florida Agriculture and Mechanical University (FA&MU) will be responsible for storing data about project participants at FA&MU.
- Co-PIs Isokpehi at Bethune-Cookman University (BCU), Rahman from Morgan State University (MSU), Noubissi-Kamdem from Jackson State University (JSU), Roecklein-Canfield at Simons University (SU) Wang at Cal State University, LA (CSULA), Liang at Lane College (Lane), and Simmons at Jarvis Christian College (JSC) will be responsible for storing data about project participants at their corresponding institutions, BCU, MSU, JSU, SU, CSULA, Lane, and JSC, respectively.
- The evaluator (Ikle, Idea of Mind Inc.) will be responsible for storing evaluation related raw data related to the evaluation.