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REU Site: Engineering Education Research on Undergraduate Engineering Students' Problem Solving Capacity

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Data Management Plan

The proposed REU Site program consists of four research projects that share a common theme: Problem Solving in engineering education. During the three-year program period, data will be collected, stored, distributed, and shared in accordance with the Institutional Review Board (IRB) protocol.

1. Data Collection and Storage

Two types of data will be generated over the course of the proposed REU Site program, including analyzed data and the metadata that defines how these data are generated. Raw data (based on which analyzed data is generated) will be collected from research project activities that use a number of data collection tools and instruments. To ensure privacy, each student's name along with a code that will be used to match the name and participant study ID code will be assigned. The coded list will be maintained by the researchers and kept in a secure place.

Interview sessions will be recorded, transcribed, and coded. In addition, to avoid any loss of artifacts, the artifacts collected will also be digitized. The digital data will be stored in a secure computer. Other digital data saved in DVD and hardcopy media will be stored in a locked file cabinet in a locked room.

All digital files containing identifiable participant information will be stored and either hardware or software encrypted. Materials that identify subjects will be destroyed after three years.

2. Data Distribution and Sharing

Because Institutional Review Board (IRB) policy restricts the dissemination of research data collected, the project team has consulted with the IRB officers at Utah State University about the extent to which publishing research data are allowed. During the three-year program period, we will archive data collected for our research projects and create a Web-based platform infrastructure to make relevant and selected resources available to the public. The platform will be a secured website with an authentication system that requires a unique username and password. The system will be maintained by the PI and the Co-PI. Each REU student will be required to regularly post their presentation materials there. An on-line demonstration of each project will also provide materials to aid students in subsequent years in choosing their project. Quantitative and qualitative data (i.e., collected from recorded interviews and artifacts) will be archived and all identifying information about the participants will be removed and replaced with a new set of participant codes. To that end, we will create new data sets in which identifying information is removed before putting it online.

Individuals who demonstrate a legitimate educational interest in gaining access to this Web-based platform infrastructure will be required to complete an online request form (or email the PI or the Co-PI), stating the purpose for accessing the raw data of our projects and how they plan to use them. If the request is granted, proper IRB clearances will be filed. Thereafter, users may download the collected, unidentified data. We will expect anyone who uses the data to share with the public their findings or lessons learned through the same Web-based infrastructure.

In addition to the above-described Web-based platform infrastructure for data release, we will release the relevant data in the form of journal articles and conference presentations. A description of the program results and major research findings will also be uploaded to the online National Science Digital Library (www.nsdl.org) and Engineering Pathway Digital Library (www.engineeringpathway.com).