

Award Number (FAIN): 2325099

Award Instrument: Standard Grant

Award Date: 07/17/2023

Award Period of Performance: Start Date: 01/01/2023 End Date: 08/31/2023

Project Title: RESEARCH: THE FORMATION OF ENGINEERS IN THE RESEARCH LAB: A COGNITIVE ETHNOGRAPHIC STUDY

Funding Opportunity: PD 17-1340 Research in the Formation of Engineers (RFE)

Data Management Plan:

Roles and responsibilities: The project's principal investigator, Dr. Magdalena Grohman, will ultimately be responsible for all of the data management. It is Dr. Grohman's responsibility to make sure all of the project team members are taught the proper data management skills and uphold the data management requirements. The co-PIs, Dr. Matthew J. Brown (Southern Illinois University) and Dr. Nicholas Gans (University of Texas at Arlington) will have access to the data.

Training: The PI and co-PIs have completed required trainings such as human subject protection training, responsible conduct of research training and information security training at their respective institutions. The certificates of completion have been included in the UNT IRB protocol.

Types of data produced: Participant-observation and data collection will continue to be conducted at the primary field site at UT Dallas. However, all data collected at the primary field site will be maintained and backed up at UNT. To date, the data consist of videos, audio recordings, photos, discourse transcriptions, interview transcriptions, field notes, and secondary data including numerical data and video documentation. Images may be stored in JPEG format and the composite video constructed from these pictures may be stored in AVI format with minimal compression in the XVID codec. Additional copies of data may be stored in other formats such as .mp4, .mov, .wmv as needed. Documents will be stored in text, PDF, Microsoft Word, and Power Point as appropriate. As this project involves observations and interviews of members in the engineering lab, all data management will comply with UNT Institutional Review Board policy. No personal information will appear in disseminated results or public data. Personal information and links between names and identifier numbers will be kept separately. All computers and hard drives used in this project will follow UNT encryption and information security policies to protect personal information.

Metadata Protocol: The research data has been managed under the divided categories: the collected data and the secondary data. The collected data includes videos, photos, recorded interviews, interview transcriptions, field notes, and other forms of collected (raw) data. The secondary data includes numerical data produced from the raw data, graphs, tables, images, slides, edited video clips, video and photo documentations, and other forms of analyzed or interpreted data. All the data will be labeled and indexed accordingly. The index of the data will be updated regularly. Sensitive information such as personal identification will be separately indexed and managed.

Policies for storage, access, and sharing: Before the award transfer, the research data has been archived in the digital format in the secured cloud storage approved by the UT Dallas Office of Information Technology (UTD-OIT) and on the encrypted hard drive. Going forward, the data storage will be performed in a safe and effective manner, with sufficient provisions for backup and recovery in case of equipment failure, including use of secure cloud storage approved by IT staff at College of Applied & Collaborative Studies, UNT. Data in non-digital format such as field notes of participatory observation will be stored in the secured file cabinet in the Faculty Work Space at College of Applied & Collaborative Studies. The PI and co-PIs will have a complete access to the research data.

Period of data retention: No specific limit is envisioned at this time for the length of data retention after public release of the research outcomes. The raw data including videos, photos, and audio recordings from observation and interviews will be retained at least three years subsequent to the termination of the grant. The numerical data that is used for the generation of plots, figures, and tables in technical proceedings will be retained for at least three years subsequent to the termination of the grant or three years subsequent to the public release, whichever is later. Non-digital form data will also be retained for at least three years subsequent to the termination of the grant or three years subsequent to the public release, whichever is later. Following UNT data management guidelines, the data will be archived in UNT Data Repository.

Policies for re-use and re-distribution: 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 releases of data will be at the earliest reasonable time. The results will be accessible through publications, seminars, and dissemination via the web. Specifically, the proposed activity findings will be promptly presented in local, regional, national conferences. Anticipated conferences include the Consortium for Socially Relevant Philosophy of/in Science and Engineering (SRPoiSE), Society for Philosophy and Technology (SPT), the Association for Practical and Professional Ethics, American Society of Engineering Education (ASEE), National Association of Research in Science Teaching (NARST).

The PIs will publish the outcome of the investigation in journal papers. Candidate journals include Science and Engineering Ethics, *Techne*, IEEE Transactions on Education, IEEE Science and Engineering Education Journal, Science Technology and Human Values, and Journal of Cognition and Culture. Graduate theses can be published from the results of the proposed activity, which will be accessible to the public. The PIs will also publicize the research results on their websites via multimedia slides or video presentations. Conference presentations will be publicly hosted via Google Documents or similar online repository.

Post-award monitoring: After an award is made, data management will be monitored primarily through the normal annual and final report process to NSF.