Plan Overview

A Data Management Plan created using DMPTool

Title: Extended Reality for Cabin Safety I: A Translational Study of Extended Reality Technology in Training and Research

Creator: Levi Breeding

Affiliation: United States Department of Transportation (DOT) (transportation.gov)

Funder: United States Department of Transportation (DOT) (transportation.gov)

Template: U.S. Department of Transportation: Data Management Plan (DMP)

Project abstract:

A translational study provides an informed approach to solving issues based on scientific research. This study provides background information on XR technology; discusses its use, value, and potential; and provides suggestions for practical application to solve certain issues based on the research. A review of the ELEVAID evacuation simulation computer program is also evaluated for its use in aircraft cabin safety research. In this study, several qualitative and quantitative findings are reviewed to provide a better understanding of the use of XR technology across an array of disciplines. Important considerations for implementing this tool are discussed herein with a focus on positive knowledge transfer and reduced cognitive load. These constructs are supported further by offering psycho-social and physiological considerations when implementing this technology in learning. Finally, an examination of integrating the technology into aviation training and research is presented along with identified gaps in the research for future investigation. The conclusions of this study show XR is mature enough to conduct certain scientific studies; does possess the necessary elements for a positive transfer of knowledge in training by mitigating cognitive load factors; and does address a large gap in current training methodologies by allowing participants to experience anomalous and dangerous scenarios without physical harm. Data-driven implementation of XR technology in key areas of cabin safety research, emerging technology and trends, flight attendant training, and passenger education has the potential to assist the Federal Aviation Administration in the development of adequate tools and systems to advance its mission.

Start date: 03-03-2021

End date: 10-31-2021

Last modified: 05-09-2022

Copyright information:

Extended Reality for Cabin Safety I: A Translational Study of Extended Reality Technology in Training and Research

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Persistent Link

Include the persistent identifier (PID) that is associated with the dataset.

Question not answered.

Recommended Citation

The recommendeded data citation to be used when citing the dataset.
Recommended Citation:

Breeding, L. L., Weed, D. B., & Beben, M. S. (2021). *Extended reality for cabin safety I: A translational study of extended reality technology in training and research.* (Report No. DOT/FAA/AM-21/TBD). Federal Aviation Administration.

Change Log

Document the changes that are made to the DMP, any and all changes should be noted to ensure a more complete documentation.
Change Log:
2021-07-29: Initial DMP written.
2021-12-29: Updated title to reflect report title. Corrected and updated the recommended citation.

CONTENTS

Include a table of contents, in order to better organize the DMP.

Question not answered.

0. Dataset and Contact Information

Please provide the following information:

- **Name of the dataset or project for which data is being collected**
- **Project number, contract number, or other number used to link this DMP**
- **Name of the person submitting this DMP -ORCiD of the person submitting this DMP**
- **Email and phone number of the person submitting this DMP**
- **Name of the organization for which the person submitting this DMP is working for**
- **Email and phone number for the organization**
- **Link to organization or project website**
- **Date the DMP was written**

0. Dataset and Contact Information:

Extended Reality (XR) for Cabin Safety I: A Translational Study of XR Technology in Training and Research
DOT/FAA/AM-21/TBD
Levi L. Breeding - 0000-0003-2740-2790
levi.l.breeding@faa.gov (405) 954-0692
Federal Aviation Administration, Civil Aerospace Medical Institute
http://www.faa.gov/go/oamtechreports/
2021-07-29

1. Data Description

Name the data, data collection project, or data producing program.
1. Data Description:
Extended Reality (XR) for Cabin Safety I: A Translational Study of XR Technology in Training and Research

Describe the purpose of your research.

This study provides background information on XR technology; discusses its use, value, and potential; and provides suggestions for practical application to solve certain issues based on the research. A review of the ELEVAID evacuation simulation computer program is also evaluated for its use in aircraft cabin safety research.

Describe the data that will be generated in terms of nature and scale (e.g., numerical data, image data, text sequences, video, audio, database, modeling data, source code, etc.).
The first iteration of this study will produce a report without a numerical dataset.

Describe methods for creating the data (e.g., simulated; observed; experimental; software; physical collections; sensors; satellite; enforcement activities; researcher-generated databases, tables, and/or spreadsheets; instrument generated digital data output such as images and video; etc).
This report describes research of the extant literature and makes conclusions about the use, reliability, and validity of using XR in training and research therein.

Discuss the period of time data will be collected and frequency of update.
The literature review was conducted between March 2021 and May 2021.

If using existing data, describe the relationship between the data you are collecting and existing data.
No numerical data were used in this report. However, the cited resources in this report provided context and historical background information. The report advances the literature on the subject as it relates to the aviation sector.

List potential users of the data.
The potential users of this report are policy makers and advisors; airline safety managers; airline training managers and developers; research teams; academia; and other industries.

Discuss the potential value of the data have over the long-term for not only your institution, but also for the public.
The potential value of this report is advancing the literature on a new and novel technology used in training and research. This report provides the basic framework from which future study will be built upon. In the future, this research should focus on specific investigations of cabin safety research, flight attendant training modalities, emerging technologies, and passenger education.

If you request permission not to make data publicly accessible, explain rationale for lack of public access.

Question not answered.

Indicate the party responsible for managing the data.
Levi L. Breeding, Principal Investigator

Describe how you will check for adherence to this data management plan.
I will review this plan at least once quarterly to ensure adherence.

2. Standards Employed

List in what format(s) the data will be collected. Indicate if they are open or proprietary.
2. Standards Employed:

Resources for this project include using ProQuest, Google Scholar, and other online libraries for peer-reviewed journal articles. For non-scholarly information, Google search engine was used to understand the current market and growth of the technology.

If you are using proprietary data formats, discuss your rationale for using those standards and formats.

Question not answered.

Describe how versions of data be signified and/or controlled.
Versions of the report are identified by using a sequential numbering system to indicate major and minor revisions.

If the file format(s) you are using is(are) not standard to your field, describe how you will document the alternative you are using.

Question not answered.

List what documentation you will be creating in order to make the data understandable by other researchers.

Question not answered.

Indicate what metadata schema you are using to describe the data. If the metadata schema is not one standard for your field, discuss your rationale for using that scheme.

Question not answered.

Describe how will the metadata be managed and stored.

Question not answered.

Indicate what tools or software is required to read or view the data.
A current web browser will be needed to access the online report. The report will be generated in Adobe PDF file format, which will require, at minimum, PDF reader software.

Describe your quality control measures.
The author managed and maintained all versions of the report, using track changes when necessary, to preserve the content and intent of the report.

3. Access Policies

Describe what data will be publicly shared, how data files will be shared, and how others will access them.
3. Access Policies:

The report will be made available to the public domain and will be made available at http://www.faa.gov/go/oamtechreports/

Indicate whether the data contain private or confidential information. If so:

- Discuss how will you guard against disclosure of identities and/or confidential business information.
- List what processes you will follow to provide informed consent to participants.
- State the party responsible for protecting the data.

This report does not contain private or confidential information.

Describe what, if any, privacy, ethical, or confidentiality concerns are raised due to data sharing.
No concerns are associated with this report.

If applicable, describe how you will deidentify your data before sharing. If not:

- Identify what restrictions on access and use you will place on the data.
- Discuss additional steps, if any you will use to protect privacy and confidentiality.

This report does not contain PII.

4. Re-Use, Redistribution, and Derivative Products Policies

Name who has the right to manage the data.
4. Re-Use, Redistribution, and Derivative Products Policies:

This report is managed by the Federal Aviation Administration. The report is in the public domain, and may be re-used without restriction. Citation of the report is appreciated. Please use the following recommended citation:
Breeding, L. L., Weed, D. B., & Beben, M. S. (2021). Extended reality (XR) for cabin safety I: A translational study of XR technology in training and research. Retrieved from http://www.faa.gov/go/oamtechreports/

Indicate who holds the intellectual property rights to the data.
The Federal Aviation Administration holds the intellectual property rights to this report.

List any copyrights to the data. If so, indicate who owns them.

Question not answered.

Discuss any rights be transferred to a data archive.

Question not answered.

Describe how your data will be licensed for reuse, redistribution, and derivative products.

Question not answered.

5. Archiving and Preservation Plans

Discuss how you intend to archive your data and where (include URL).
5. Archiving and Preservation Plans:
This report will be archived at http://www.faa.gov/go/oamtechreports/

Indicate the approximate time period between data collection and submission to the archive.

Question not answered.

Identify where data will be stored prior to being sent to an archive.
This report will be located and archived at http://www.faa.gov/go/oamtechreports/

Describe how back-up, disaster recovery, off-site data storage, and other redundant storage strategies will be used to ensure the data's security and integrity.

Question not answered.

Describe how data will be protected from accidental or malicious modification or deletion prior to receipt by the archive.

Question not answered.

Discuss your chosen data archive's policies and practices for back-up, disaster recovery, off-site data storage, and other redundant storage strategies to ensure the data's security and integrity for the long-term.

Question not answered.

Indicate how long the chosen archive will retain the data.

Question not answered.

Indicate if the chosen archive employs, or allows for the recording of, persistent identifiers linked to the data.

Question not answered.

Discuss how your chosen data repository meets the criteria outlined on the [Guidelines for Evaluating Repositories for Conformance with the DOT Public Access Plan](#) **page.**

Question not answered.

6. Policies Affecting this Data Management Plan

Include policies that the data management plan was created to meet, such as the DOT public access plan.
6. Policies Affecting this Data Management Plan:
This data management plan was created to meet the requirements enumerated in the U.S. Department of Transportation's "Plan to Increase Public Access to the Results of Federally-Funded Scientific Research" Version 1.1 << https://doi.org/10.21949/1520559 >> and guidelines suggested by the DOT Public Access website << https://doi.org/10.21949/1503647 >>, in effect and current as of July 29, 2021.

Planned Research Outputs

Report - "Extended Reality (XR) for Cabin Safety I: A Translational Study of XR Technology in Training and Research"

A translational study provides an informed approach to solving issues based on scientific research. This study provides background information on XR technology; discusses its use, value, and potential; and provides suggestions for practical application to solve certain issues based on the research. A review of the ELEVAID evacuation simulation computer program is also evaluated for its use in aircraft cabin safety research. In this study, several qualitative and quantitative findings are reviewed to provide a better understanding of the use of XR technology across an array of disciplines. Important considerations for implementing this tool are discussed herein with a focus on positive knowledge transfer and reduced cognitive load. These constructs are supported further by offering psycho-social and physiological considerations when implementing this technology in learning. Finally, an examination of integrating the technology into aviation training and research is presented along with identified gaps in the research for future investigation. The conclusions of this study show XR is mature enough to conduct certain scientific studies; does possess the necessary elements for a positive transfer of knowledge in training by mitigating cognitive load factors; and does address a large gap in current training methodologies by allowing participants to experience anomalous and dangerous scenarios without physical harm. Data-driven implementation of XR technology in key areas of cabin safety research, emerging technology and trends, flight attendant training, and passenger education has the potential to assist the Federal Aviation Administration in the development of adequate tools and systems to advance its mission.

Planned research output details

Title	Type	Anticipated release date	Initial access level	Intended repository(ies)	Anticipated file size	License	Metadata standard(s)	May contain sensitive data?	May contain PII?
Extended Reality (XR) for Cabin Safety I: A Transl ...	Report	2021-12-01	Open	None specified		Creative Commons Attribution 4.0 International	None specified	No	No