OBJECTIVE: Develop a methodology and associated computer based tool to define the type of training delivery methods that are most effective and efficient to perform aircraft maintenance training.

DESCRIPTION: The USAF aircraft maintenance training community has identified a need for a tool to aid in the decision process for selecting the most appropriate training format for students to learn aircraft sustainment maintenance actions. Specific maintenance actions are derived from training requests from both training units and active aircraft maintenance units, which will have a varied set of constraints. Current practice is to utilize corporate knowledge, best practices, and maintenance training requesters’ opinions, coupled with skilled maintainers (not educators or training specialists) to determine the appropriate training format. With the emergence of new technologies such as Virtual Reality, Augmented Reality, and Mixed Reality, the AF training community desires to evaluate the benefits they could bring to students’ initial understanding, as well as knowledge retention. Part of that is also determining the most appropriate opportunities to insert the new technology into the current training curriculum. The ultimate objective is to identify the type of training delivery method that yields the most value.

PHASE I: USAF will only accept Direct to Phase II proposals.

PHASE II: Develop, demonstrate, and deliver a methodology and associated computer based tool to define the type of training delivery methods that are most effective and efficient to perform aircraft maintenance training, based on: learning objectives, student skill state, technology availability, resource/environment/programmatic/mission constraints, etc. The methodology shall incorporate the results of rigorous scientific and engineering research and analysis regarding education and training effectiveness. The methodology is expected to evaluate currently utilized training methods, to include, but not limited to, written, 2D/3D images, instructor presentation, computer based training (CBT), interactive CBT, hands-on instruction, etc. as well as state of the art instruction methods, to include, but not limited to, Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), environmental feedback, etc. The tool is to be utilized by USAF aircraft maintenance training content development teams who are trainers, not experts in the theory of education. Phase II deliverables will be a methodology to define the best suited training delivery method(s) and a computer based tool that follows the methodology that is to be used by training content developers.

PHASE III DUAL-USE APPLICATIONS: Refine and mature the training delivery decision tool to be marketed to other defense and commercial customer who require the ability to determine which type of training delivery method is best for the learning objective(s) and constrains related to aircraft maintenance training.

REFERENCES:

KEYWORDS: training, education, virtual reality, augmented reality, mixed reality, learning objectives, immersive, interactive multi-media instruction, VR, AR, MR, IMI, XR, eXtended Reality, aircraft maintenance