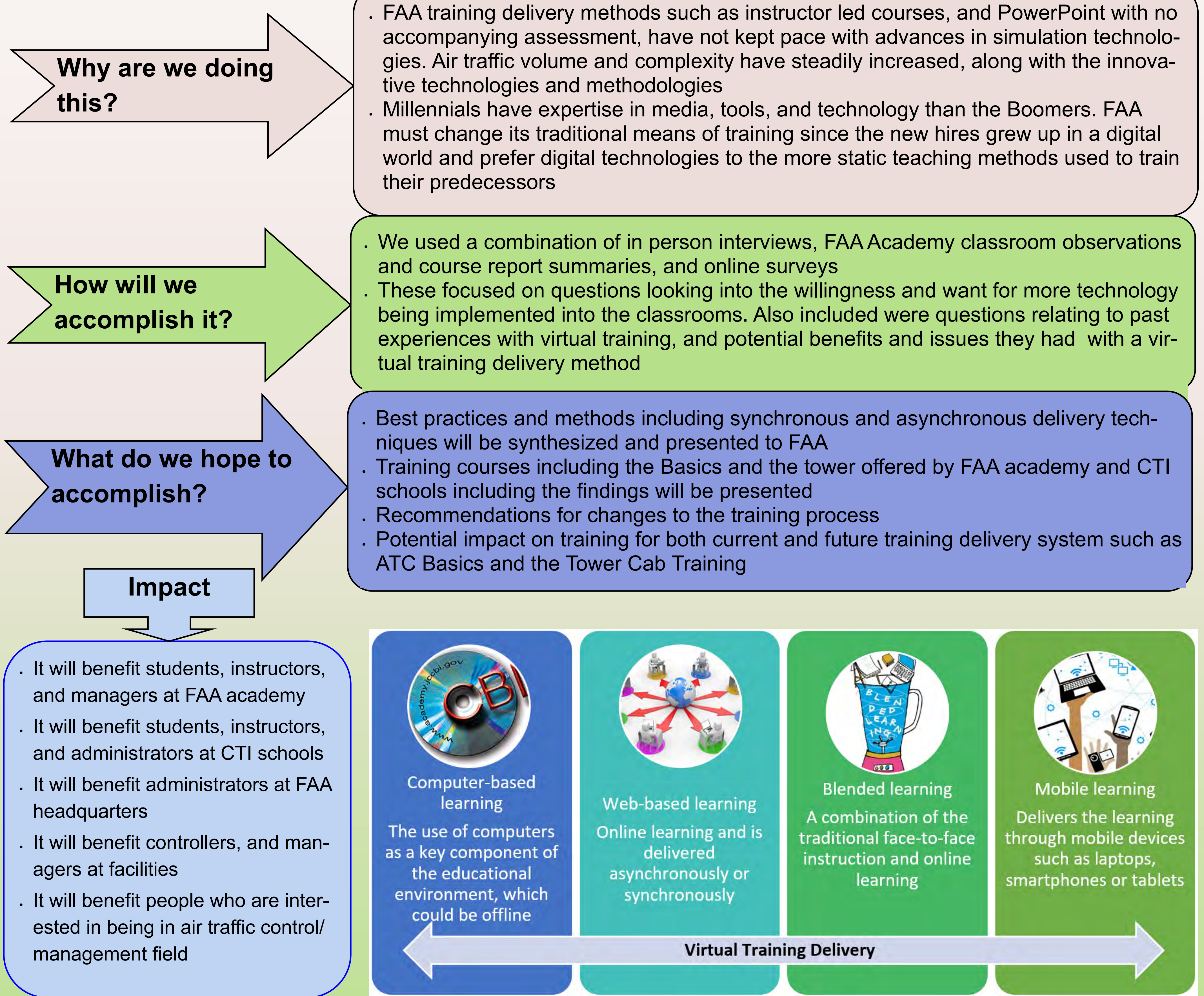


Best Practices and Best Methods of Virtual Training Delivery for Air Traffic Controllers

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FAA Academy classroom observations and course report summary

- Pass rate of the Tower Cab Training course was low
- Traditional classroom without learning management system used at FAA academy
- Students cannot access class materials online before or after the classroom study
- Students are lack of simulation practice lab time after classroom concept study
- No animation/simulation/gaming is involved in the student study
- No adaptive learning was applied to the AT courses (especially to AT Basics since experienced and non-experienced students were in the same class)
- No automated grading system to standardize the performance assessment
- Hands-on/practice exercises/videos are needed for AT Basics course such as pilot's environment or weather study
- Some students mentioned that the pace of some lessons such as weather was too slow, while the pace of other lessons was too fast
- Students love the video segments

Face-to-face student interviews and lesson learned

- Six students and one instructor were interviewed at FAA academy in August 2017
- Responded unanimously and believe they will have the ability to have more hours in the simulation labs with a virtual format.
- Current course videos and animations are outdated. Poor quality of graphics and videos
- No automated pretest and posttest to test student's understanding after each topic
- Instructor's personal style and pacing should be tailored in the virtual training environment
- More teamwork is needed for AT Basics course
- Felt that the AT Basics course can be switched to the web-based learning since no lab simulation is involved in the course.
- Students believe that as millennials, they have the ability to use new technology to teach themselves in a virtual environment.
- Students preferred hybrid learning with information online and traditional hands-on training methods, rather than a completely virtual format

Student and instructor's perception of virtual training delivery on ATC Basics and The Tower Cab Training courses will be studied through online survey questions (35 questions) at FAA Academy and Embry-Riddle Aeronautical University

Do you feel you have the technology skills needed to succeed in a virtual course?

Yes No Other: (Please Specify)

If the course is switched to a virtual format, which modality would you be interested in using? (Select all that apply)

Computer-based	Asynchronous web-based learning	Mobile learning
Synchronous web-based learning	Blended learning	Other: (Please Specify)

Recommended Solutions

- A learning management system, and infrastructure requirements is needed so that all course materials can be accessed in a virtual environment
- Based on the study courses, a blended learning should be designed and implemented
- An adaptive learning should be applied so that based on the test performance students can have the options to either repeat or jump to the next topic study
- Animation/simulation/gaming should be included in the virtual training so that students are more engaged to study by themselves
- Create a virtual community so that students can help each other and support each other
- Mobile learning environment should be created as well so that they can study anywhere and anytime
- Virtual reality (VR) can be incorporated into lessons such as (AT Basics, interactive flight simulation)
- New high quality videos should be created with interactive questions/answers to test their understanding
- Simulations which are used to illustrate wrong directions given by the controllers causing a pilot to come dangerously close to a mountain are especially important
- Interactive flight simulation can be used to predict the consequences (i.e. pilot's environment)
- Scenario based learning should be used to learn how to provide pilots with crucial information to execute approaches safely
- Reduced training length of AT Basics and emphasize teamwork and discussion in the class time with virtual training delivery
- Reduced lecture time and extended simulation practice of the Tower Cab Training course with virtual training delivery