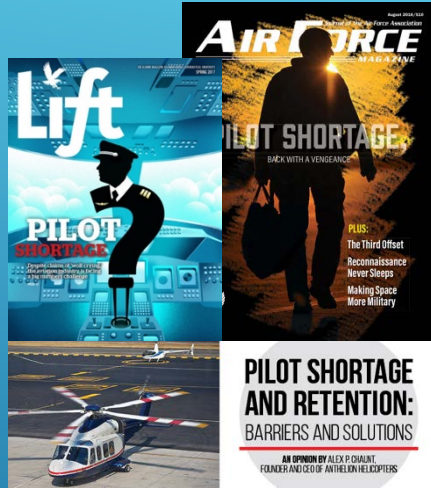


# LEVERAGING COGNITIVE SCIENCE AND VIRTUAL REALITY TO MEET TOMORROW'S TRAINING CHALLENGES

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**U.S. Army Aviation Center of Excellence**

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**Chief Scientist, Learning Next Program**  
**SAIC**

# THE CHALLENGE



- Global pilot shortages leaves militaries around the world competing with commercial airlines for talent
- Live training is very expensive: Between \$2K and \$10K per flight hour
- High Fidelity Simulators are very expensive > \$15M, but can reduce training costs to less than \$1000/hour depending on utilization
- Limited resources (aircraft, sims, instructors) at training institutions and other variables (maintenance, weather) limit the rate of production



**How can we increase the velocity of learning while improving the quality of initial entry pilots training?**

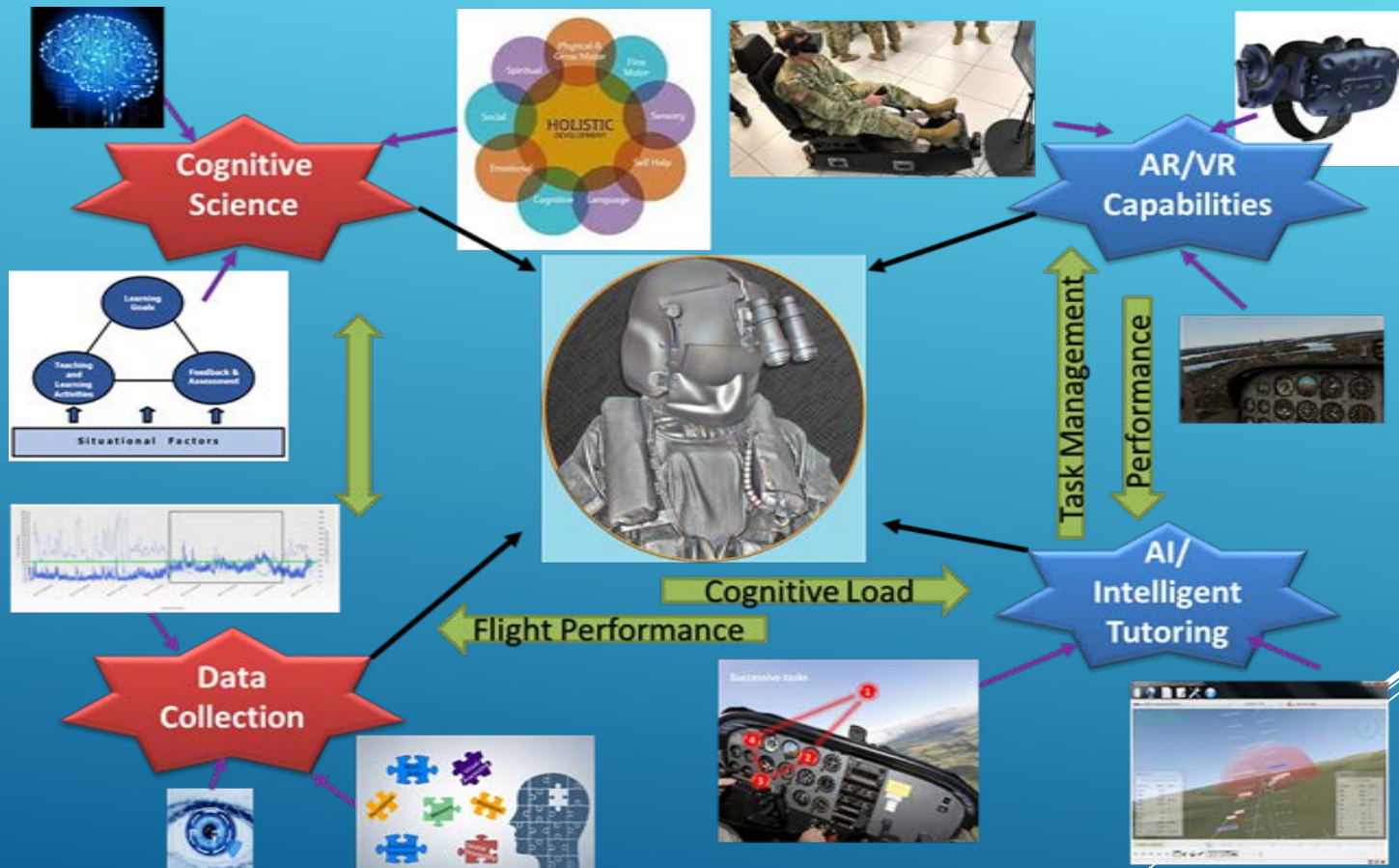
# THE OPPORTUNITY



- Advances in Cognitive science and VR Gaming technology
- Automated data collection and data science
- Artificial Intelligence/Intelligence tutoring
- New generation of trainees that readily accept new training paradigms



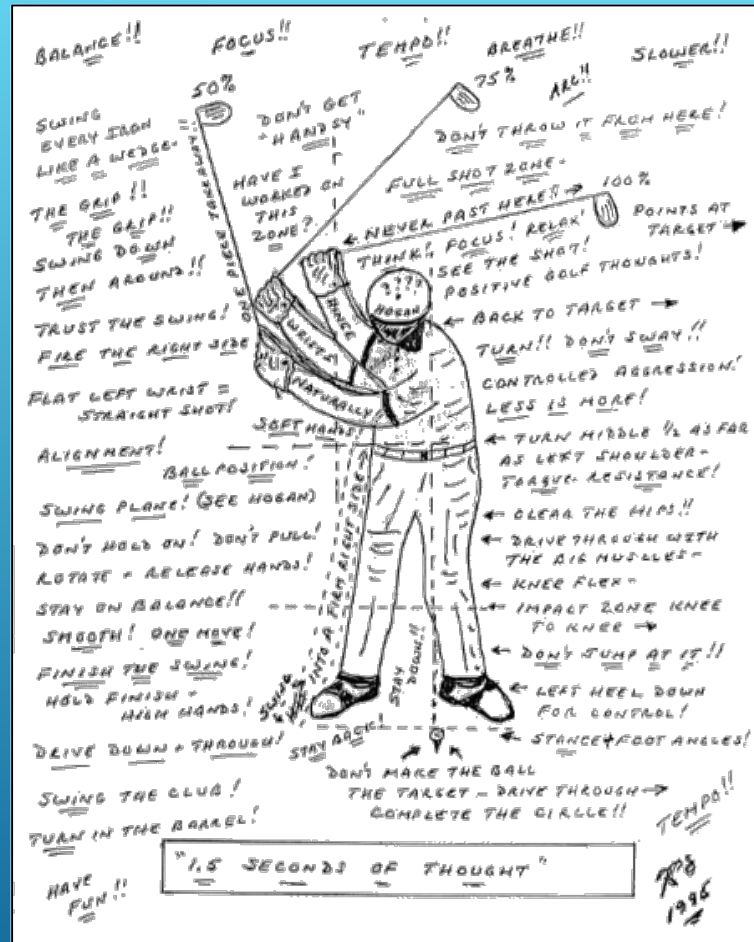
# A NEW APPROACH TO PILOT TRAINING



“Simulations will allow us to do hundreds of reps to build muscle memory and experience that we can't do live.” **GEN Milley, CSA**

“Amateurs practice till they get it right. Professionals practice till they cannot get it wrong.” **Multiple Citations**

“Now the general who wins a battle makes many calculations in his temple ere the battle is fought. The general who loses a battle makes but few calculations beforehand. Thus do many calculations lead to victory, and few calculations to defeat...is by attention to this point that I can foresee who is likely to win or lose.” **Sun Tzu**



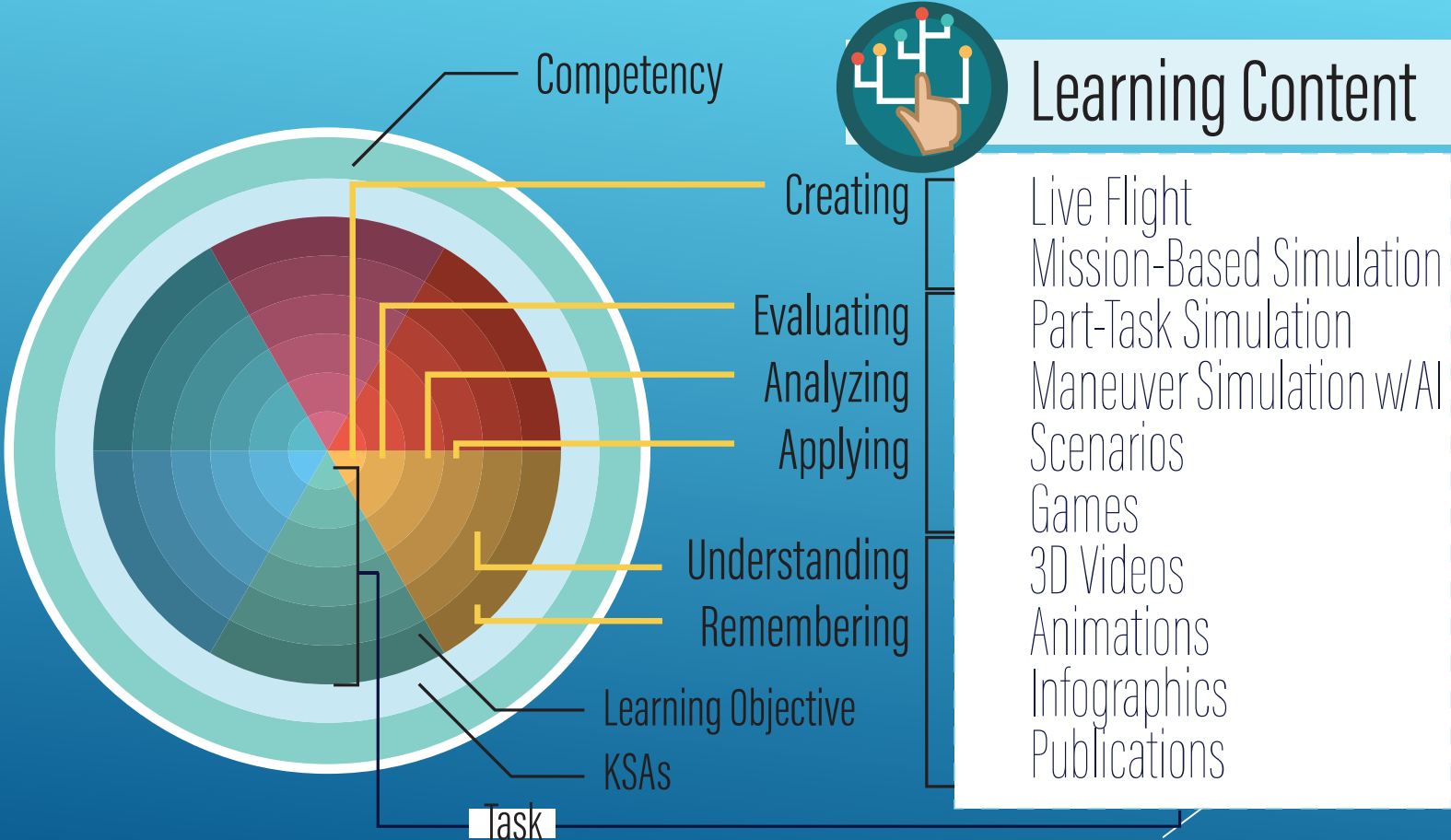
Increasing frequency and repetition to make better pilots at the best value



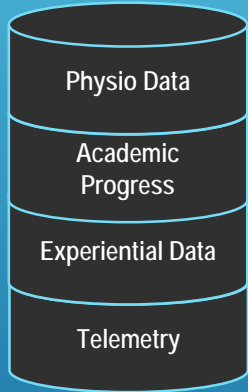
# OUR APPROACH



# INSTRUCTIONAL SYSTEMS DESIGN



# LEARNING APPROACH



Data Collection  
& Analysis



Deep Repetition of Applicable Skills



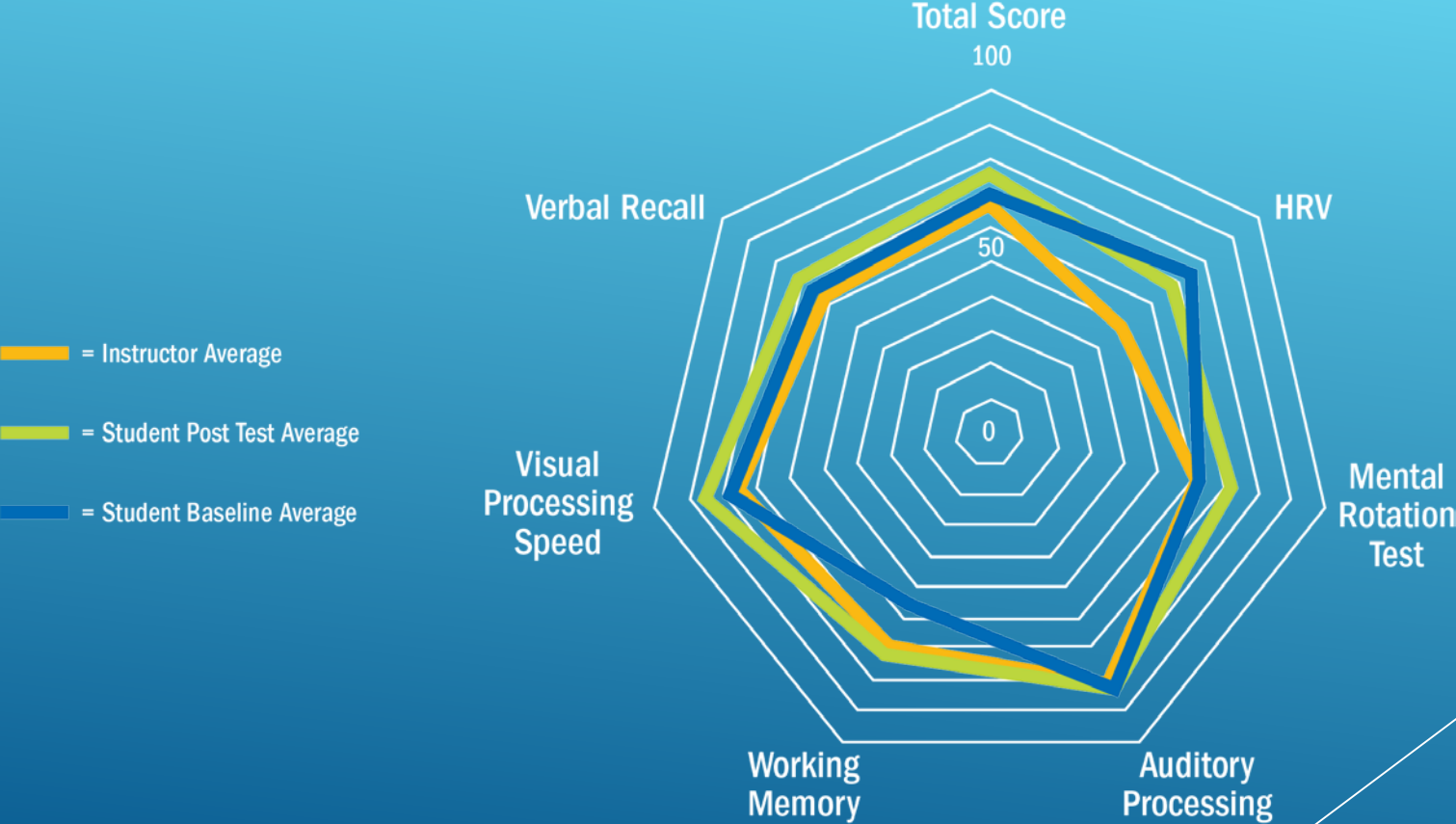
Student & Instructor Feedback

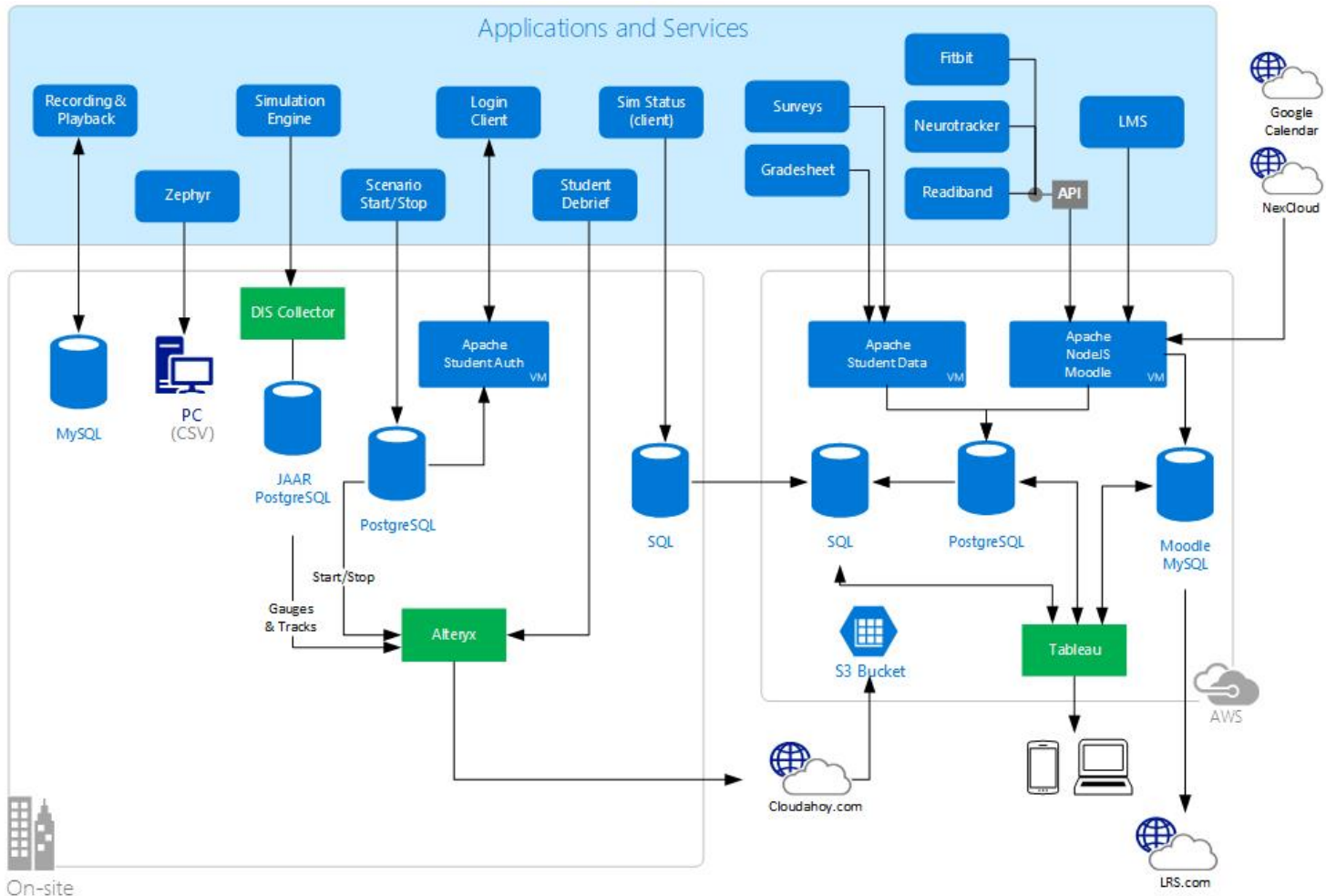


Human & Virtual  
Instructors



# COGNITIVE ENHANCEMENT TRAINING





# VALUE PROPOSITIONS



- HTC Vive
- HP Reverb
- Oculus Quest



- xAPI
- SCORM
- DIS
- HLA



- AWS
- Azure
- MSSQL
- PostgreSQL



- Tableau
- Alteryx
- GSuite



- Prepar3D
- XPlane
- Unity
- Unreal

# CHALLENGES



Visual Acuity



Fine Motor Control in VR



Culture



**QUESTIONS?**

