



Multi Pilot Simulations

APATS 2018

Safety Through Efficient Training

**“How Henry Ford and Albert Einstein
contribute to aviation training”**

MPS Mission and vision

Mission

It is MPS' mission to be a solution partner to support unique and innovative flight training solutions using state of the art Fixed Base Simulators



Vision

- A/C fleet expansion and renewal will drive a significant need for pilots
- This pilot shortage will need to be solved in a cost effective manner without sacrificing safety
- Pilot shortage leads to instructor shortage
- The role of FBS will continue to increase with broader adoption worldwide as alternative to FFS

MPS' vision is to support this effort with innovative FBS solutions that will assist the expanding airline's customer base in their training and safety needs

Speaker introduction

- Started as military pilot in the Royal Netherlands Air Force
- Civilian career
 - Flight Instructor
 - Airline Pilot (charter and scheduled services within the KLM group)
 - Instructor/Examiner
 - Head of Training and other airline management positions
- Boeing
 - Captain and instructor on 737/777 and 787 (>13.000 hours)
 - 737/737MAX Chief Technical Pilot
 - Manager of instructor pilots
 - Chief Pilot Regulatory Affairs and Regulatory Strategy
- Regulatory
 - ICAO LOCART (chair) and CBTATF (founding member)
 - FAA ARCs (vice chair)
 - EASA RMTs (current chair of EASA RMT.0581/0582 (UPRT) and RMT.0599 (EBT))
 - Member of EASA ATPG
- Since May 2018 Chief Executive Officer of MPS

Thank you to Halldale and especially

- Captain Jacques “Jack” Drappier

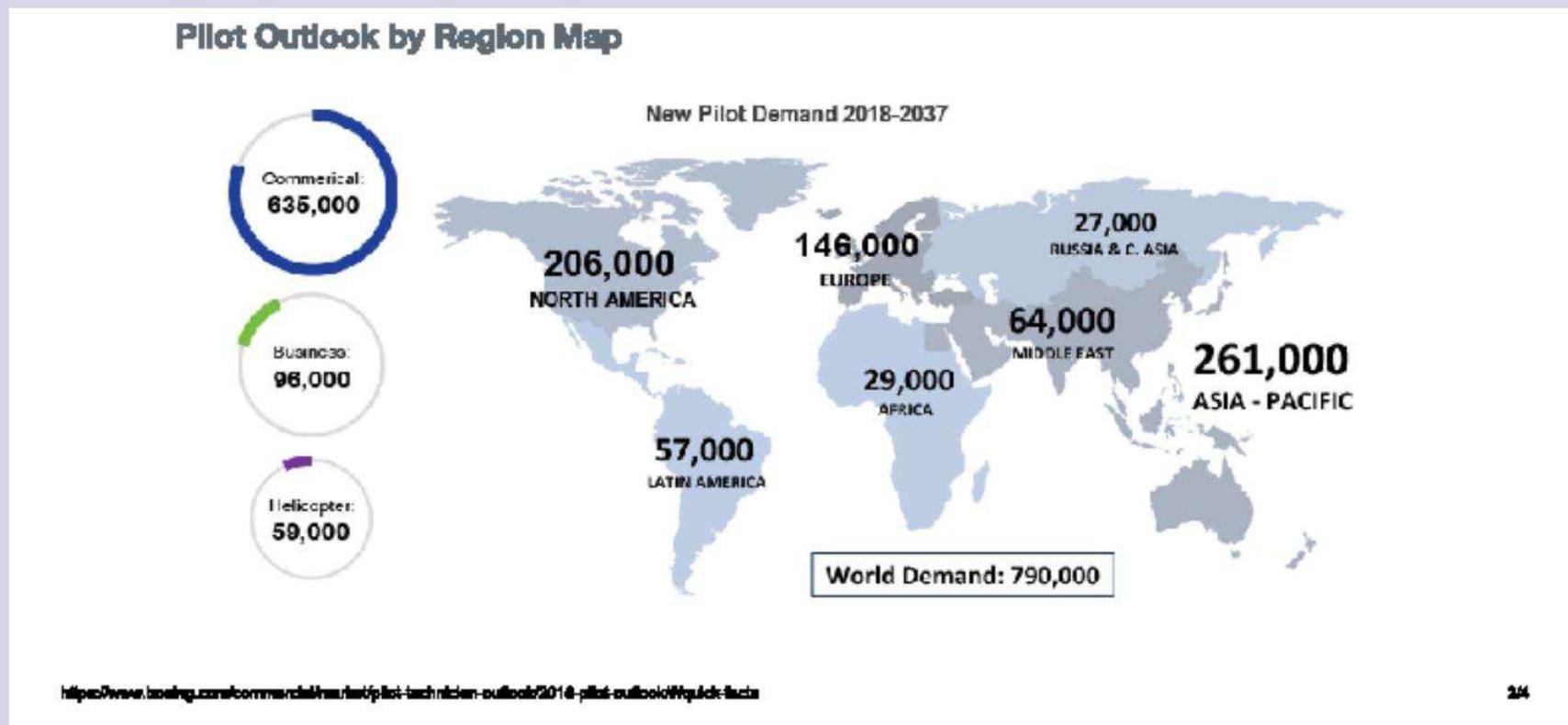


Topics

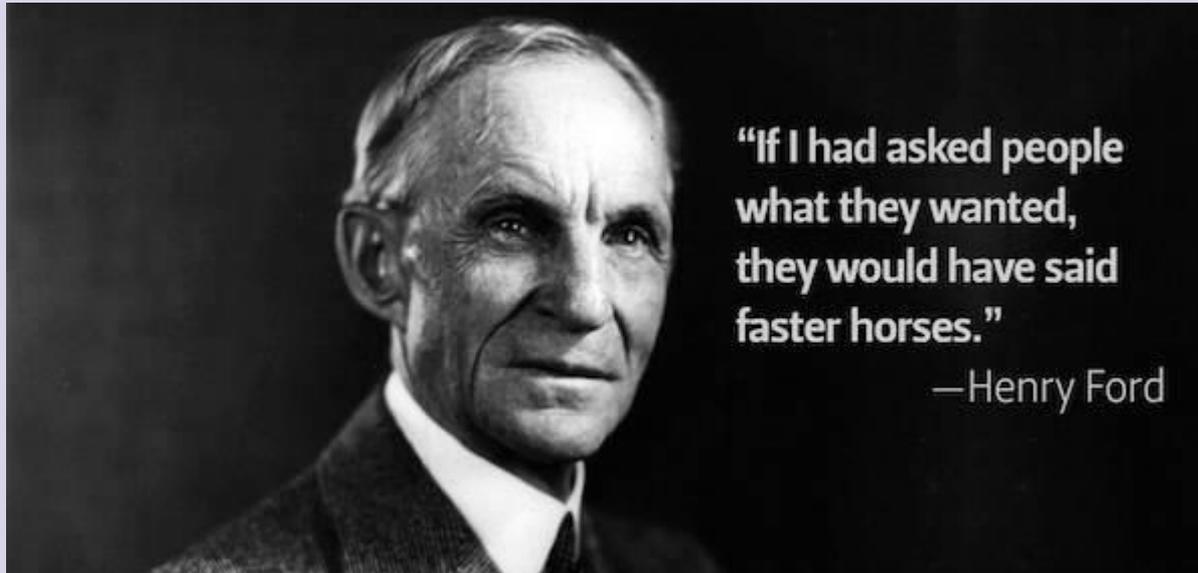
- Current needs
- From Henry Ford to Albert Einstein, what does that have to do with me?
- Historical perspective
- Current efforts to solve future needs
 - ❖ Technology
 - ❖ Regulations
- Blended and Customer focused learning
- Summary and next steps

Current needs

- According to Boeing's latest "Pilot and Technician Outlook", 790.000 pilots will be needed over the next 20 years.
 - ❖ That is 108.22 pilots PER DAY who need to be **qualified!**



Qualifying pilots through current or new means?



When we discuss innovation, this phrase might be used to illustrate one's point.

However, what does it mean in aviation training???

....and especially to you and me?

- This phrase normally is used to identify the merits of innovation through either evolution or revolution:
 - ❖ One side argues the benefits of innovating incorporating customer feedback (faster horse), and;
 - ❖ the other side argues that true innovation is created by visionaries who ignore customer input and instead manufacture innovation based solely on their prophetic vision for a better future (iPhone etc.).
- In aviation, it is generally accepted that innovation is needed. However, the industry and regulatory bodies are traditionally conservative, based on its excellent safety record. This leads a very innovative industry to lean towards faster horses.
- With current trends and stable safety records, a doubling of movements will lead to a doubling of accidents in absolute numbers. This will be unacceptable in public perception.

Is a faster horse enough to deal with this?

What is a faster horse in aviation training?

- A “faster horse” in aviation training will create qualified pilots at the same or higher level of competency, while:
 - ❖ Reducing the time of training
 - ❖ Reducing the effort, both by provider and candidate
 - ❖ Reducing the cost
 - ❖ Reducing the risk
 - ❖ Etc.
- Therefore, several faster horses must be considered:
 - ❖ Optimizing the use of current technology such as FFS, FBS and other devices
 - ❖ Incorporation of new technology, such as AR/VR, gaming developments
 - ❖ Whatever comes next
- In addition, regulatory changes are needed to allow use of these technologies and enable future ones.

But what about the training setup itself?

Why are we training this way?

- Let's look at the history of aviation training and LEARN!
 - ❖ Type Ratings were created for pilots with significant flying experience to qualify on a specific type. This included swept wing, jet airplanes that were new
 - ❖ The hours were set in regulation based on the background and the need to learn to fly a new airplane
 - ❖ Failures and exercises were based on historical data (Engine Failures form the bulk of current training)

- What happened:
 - ❖ Technology improvements and additions (FMC for example) led to a change of focus from airplane to system training. After all, the candidate could FLY already...
 - ❖ Operations became more complex (Automation, EICAS/ECAM, PBN etc.) and were included in the hours of training, taking away Type Rating Training

Current training courses are based on past events and statistics

So what's the problem?

- The demographics of the population have changed
- Training for aviation careers focuses on licenses like CPL and ATPL, but sometimes do not connect with the needs of the operators
- The current generation of pilots entering the profession learn different
- Current entrants into the profession get less “flying training” and less Type specific training during their Type Rating
- Instructors and syllabi still expect “old-fashioned” Knowledge, Skills and Attitudes (KSA's) to be present
- As with investing, past performance does not guarantee the same future results

What are we doing to address this?

- Marginal improvements over the past 30 years:
 - ❖ Use of Computer Based Training
 - ❖ Better devices
 - ❖ More training to deal with events statistics (UPRT)
 - ❖ Additional training to deal with other changes (PBN)

- Setting OEM requirements (Operational Suitability Data) for minimum training
 - ❖ Standardization leads to a higher global standard
 - ❖ However, these courses support airplane sales and are therefore minimalistic
 - ❖ These courses are sufficient to “steal an airplane only”

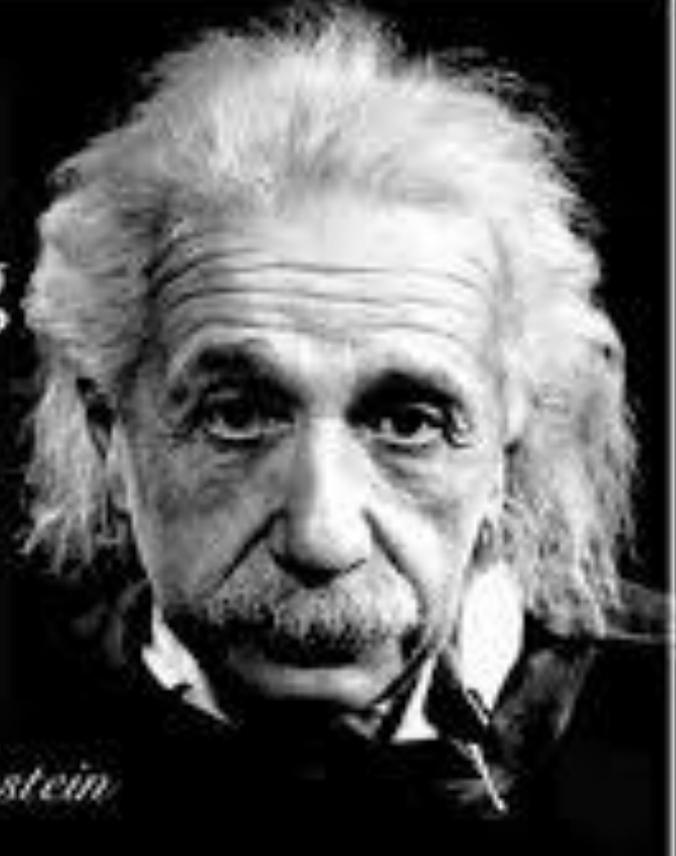
- Lengthen the same training courses to repeat exercises for exam
 - ❖ More training
 - ❖ Higher cost

Are we actually creating a faster horse?

Nope....

Insanity:
doing the same thing
over and over again
and expecting
different results.

- Albert Einstein



What changes are made or considered?

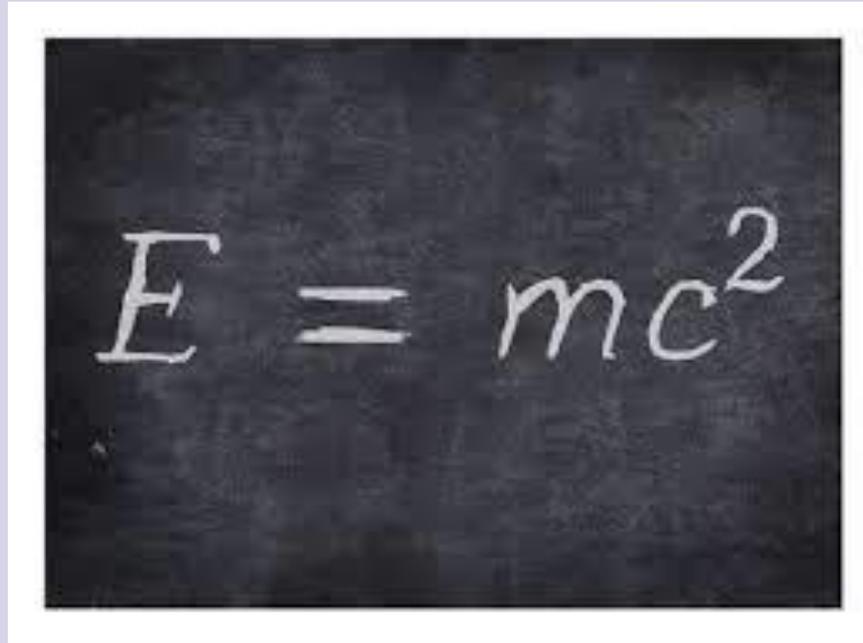
- Focus on technology
 - ❖ Technology has an important place in gaining efficiency, but in itself is not a solution
 - ❖ The risk of modern technology is that we only use what's currently here, but what is next?
 - ❖ Are we creating a \$5.000 solution for a \$5 problem?
- Focus on better **recurrent** training (EBT especially)
 - ❖ Great first step, but it overlooks the big “pilot shortage” elephant in the room
 - ❖ Undermined by addition of new requirements on a compliance base
- Focus on regulatory changes
 - ❖ Many very useful efforts are under way, but are not necessarily nearing completion
 - ❖ These issues are complex and need scientific basis and validation
 - ❖ Regulatory agencies will not (and should not) relent to commercial pressures and allow a degradation in safety

What changes are made or considered? (cont.)

Regulatory changes

- EU and EASA changes
 - ❖ The introduction of a Type Specific Airline Pilot Multi Crew Course bridges the known gap between licensing and airline needs to address the fact that the rate of acceptance of an applicant is less than 50%
 - ❖ Additional discussions are taking place with the European Commission on the need for better selection at the onset of training to increase the acceptance rates and gain efficiency
- Movement from Compliance Based Training to EBT
 - ❖ Individual Based Training (IBT) next?
- ICAO CBTATF
 - ❖ Complete look at pipeline
- EASA RMT.0599 (EBT and Performance Based Rulemaking)
 - ❖ Moving from prescriptive requirements set by past events to solution based rules
 - ❖ Alternative Training Solutions

But what did Einstein say about this?



$$\text{Efficiency} = \text{man} \times \text{course}^2$$

In other words: $\frac{1}{2}$ the experience of the pilot means the course has to be twice as good

What can be done without regulatory changes?

- Changing from “Training” to “Learning”
 - ❖ If we adapt the courses to the student, outcomes can be adjusted
 - ❖ Setting realistic expectations both in time and in effort
- Learning from other sectors and academia
 - ❖ How do kids use technology?
 - ❖ What else is being done in the gaming industry?
- Customer-focused training
 - ❖ Both the operators and the students are customers
 - ❖ Cost of success is always less than cost of failure
- Use of current/existing technology in different ways
 - ❖ Task-to-Tool identification rather than tool to task
 - ❖ **Blended Learning (used in University and other learning world-wide)**

What is the concept of Blended Learning?

- Use of Formal and informal Learning
 - ❖ Instructor driven versus self taught
 - ❖ Goals set externally or by learner

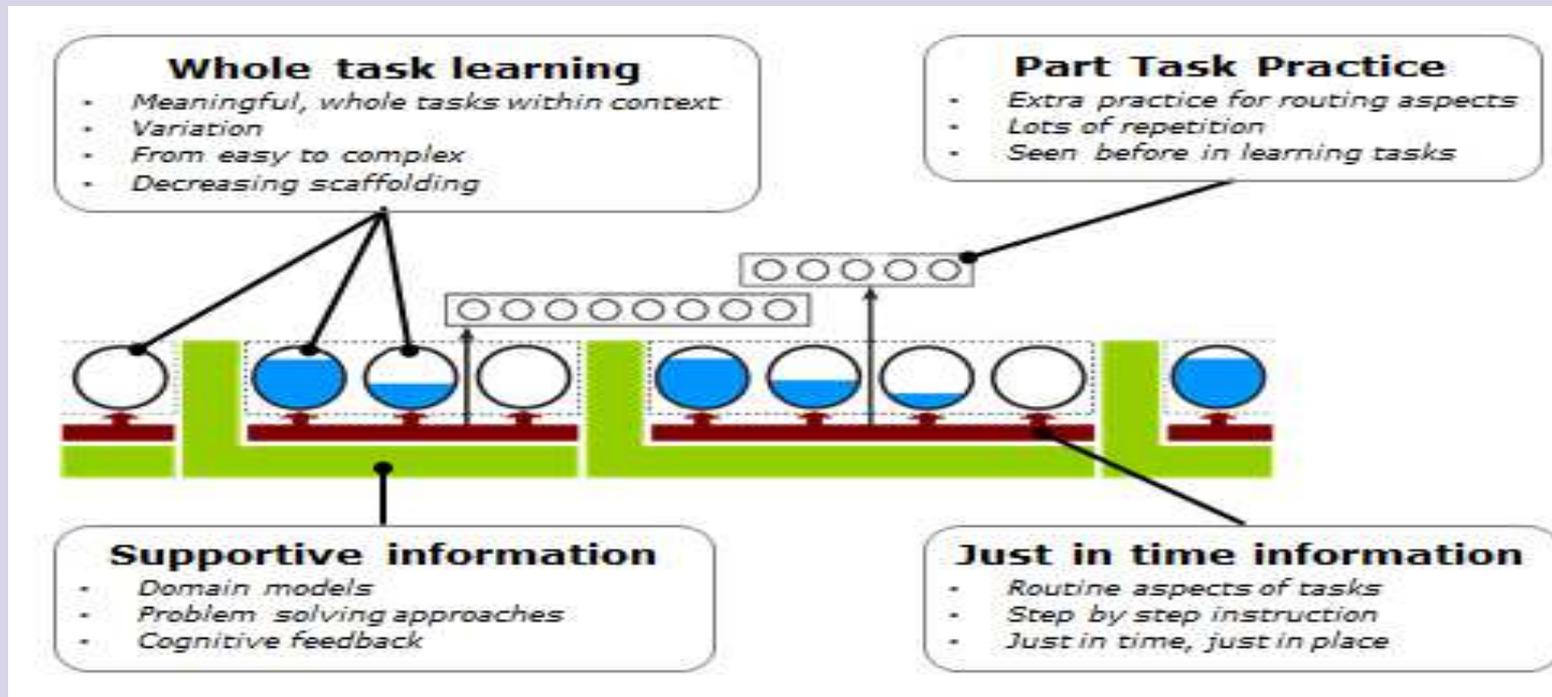
- Use of Productive and Reproductive training
 - ❖ Drilling procedures versus understanding the background
 - ❖ Application in standard situations versus creative solutions

- Use of Part task and Whole task training
 - ❖ Contrary to common belief, there are 2 kinds of part task training.
 - ✓ Either the candidate learns a single system or skill, or
 - ✓ part task training is used as a part of whole task training.
 - ❖ This latter is also called Part Task Practice, and is essential in Blended Learning to support Whole Task Training

And in a picture, it looks like this

The Four Components/Instructional Design model (4C/ID) (Van Merriënboer, 2007)

The 4C/ID model below explains the importance of blended learning which uses four main elements of learning to support learning tasks. The four main elements are whole task learning and part task practice, and supportive and just in time information.



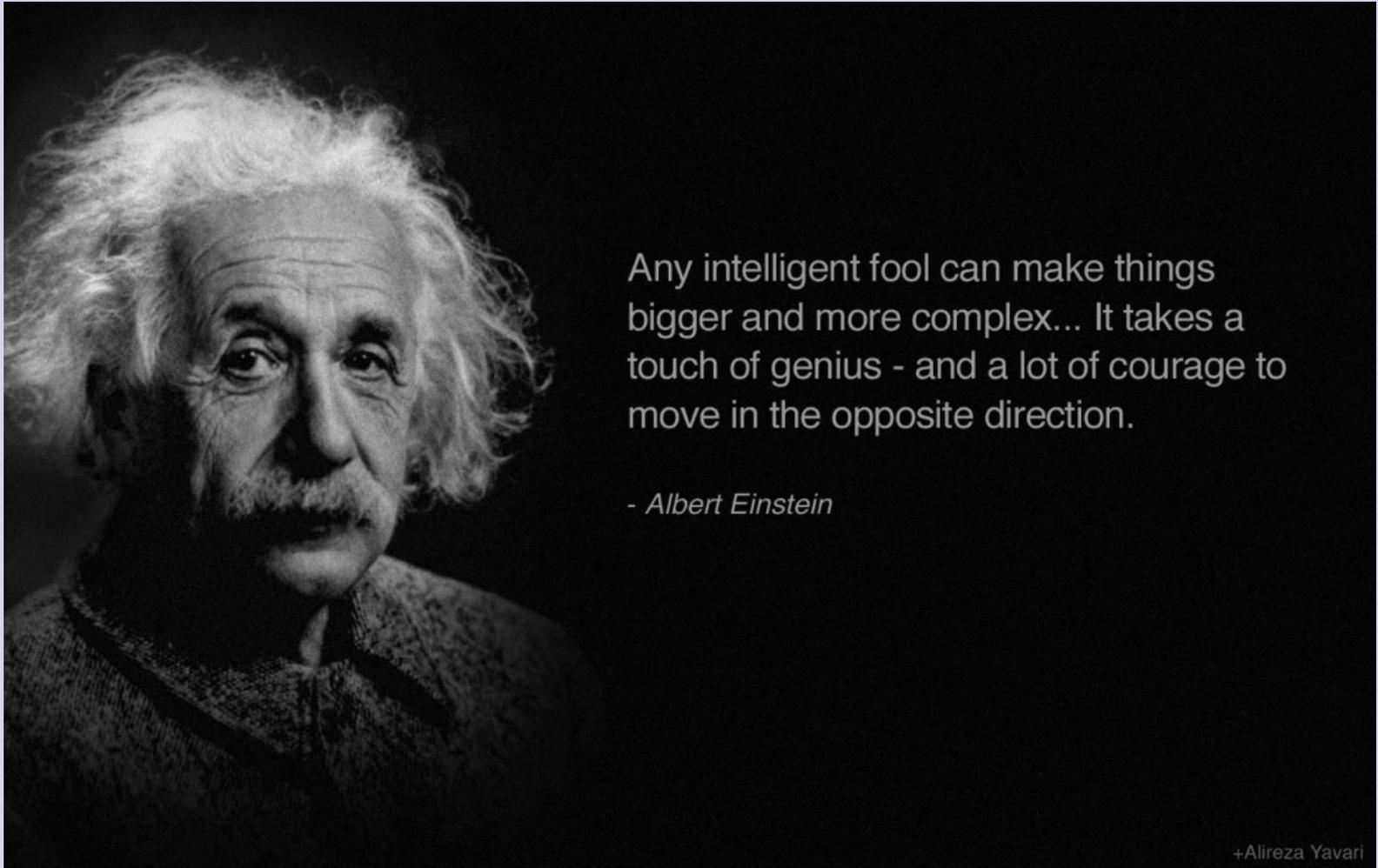
Customer focused training

- Customers being end users (operators/airlines)
 - ❖ What are their needs?
 - ❖ Be cost efficient
 - ❖ Provide a reliable and high quality pipeline

- Customers being the candidates
 - ❖ What do they want and expect?
 - ❖ Who are they (generational differences in learning etc.)
 - ❖ Provide a job at the end, not a license only

- Expanding geographical base and learn from other regions
 - ❖ Aviation is a world-wide industry, and many operators are willing to share experiences
 - ❖ Acceptance that quality training can lead to quality candidates, and that hours are a poor indication of a person's quality

Which leads to....



Any intelligent fool can make things bigger and more complex... It takes a touch of genius - and a lot of courage to move in the opposite direction.

- *Albert Einstein*

SWOT of aviation training

Strengths	Weaknesses
Safe	Archaic
Use of proven systems	Cannot cope with demand
Predictable	Local services in a global market

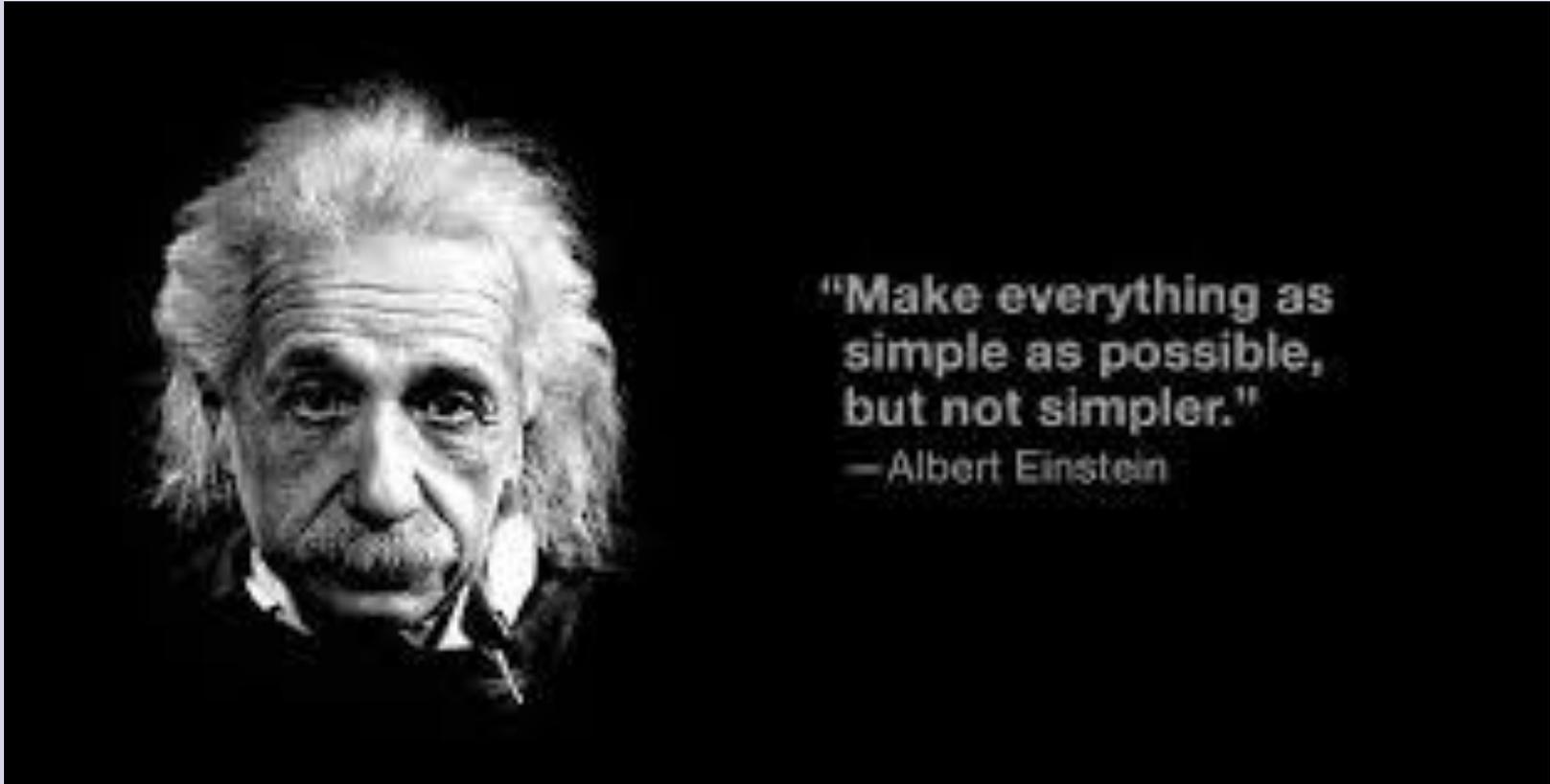
Opportunities	Threats
Expand courses for better outcome	Cost
Change from Training to Learning	Interest in the profession
Learn from other industries and science	Lack of qualified instructors
Use of modern technology	Regulatory resistance

Let's address these issues, keeping the good parts and eliminating the bad ones

Conclusion

- A faster horse **will need** to be sufficient to deal with current extraordinary demand
 - ❖ Waiting for regulatory changes will put us “behind the power curve”
- Use of Aviation Blended Learning Environments (ABLE) will improve efficiency
 - ❖ It also is a great motivational tool compared to current course setup
- Task to Tool identification will optimize the use of less costly training solutions
 - ❖ Used in an efficient way, this will lower cost and increase training quality
- Use new Technology (such as AR/VR) based on task to tool analysis
 - ❖ Don't replace current tools with technology because it is available
 - ❖ Don't provide a high cost solution if a low cost one is available
 - ❖ Focus on instructor support
- Be realistic about training needs
 - ❖ Lower student experience means better (and more) training might be needed
 - ❖ Don't lower the bar: this is not about achieving the license, but about the safety of the operations

Einstein's conclusion





Multi Pilot Simulations

Thank you

MPS is your solution partner in aviation training

MPS will engage in strategic partnerships with TDMs, OEMs, Training Organizations and airlines to provide high quality training on Fixed Base Devices.

Innovation is essential and is customer based

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