NATIONAL ASSOCIATION OF FLIGHT INSTRUCTORS

MENTOR LIVE

Leveling Up!

A Game-Based Approach to Pilot Development

Presented by:
Brandon Seltz & **Mark Thompson** of

TakeFlight® INTERACTIVE

LIVE

Introduction – Brandon Seltz

Microsoft Flight Simulator

REDBIRD FLIGHT SIMULATIONS, INC.

TakeFlight® INTERACTIVE

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Introduction – Brandon Seltz

Introduction – Mark Thompson

- Top pilot on winning team at NIFA SAFECON
- Designer of RNP/AR Approaches for Airlines
- Gold-Seal CFI
- Strong interest in how pilots learn

Goals of this Presentation

- Learn how leveraging game design can:
  - Maximize engagement and skill development
  - Get more students to certification
  - Create safer pilots
- Discover new technology that can:
  - Improve quality and consistency of instruction
  - Enable more effective use of the airplane
  - Improve the business of training

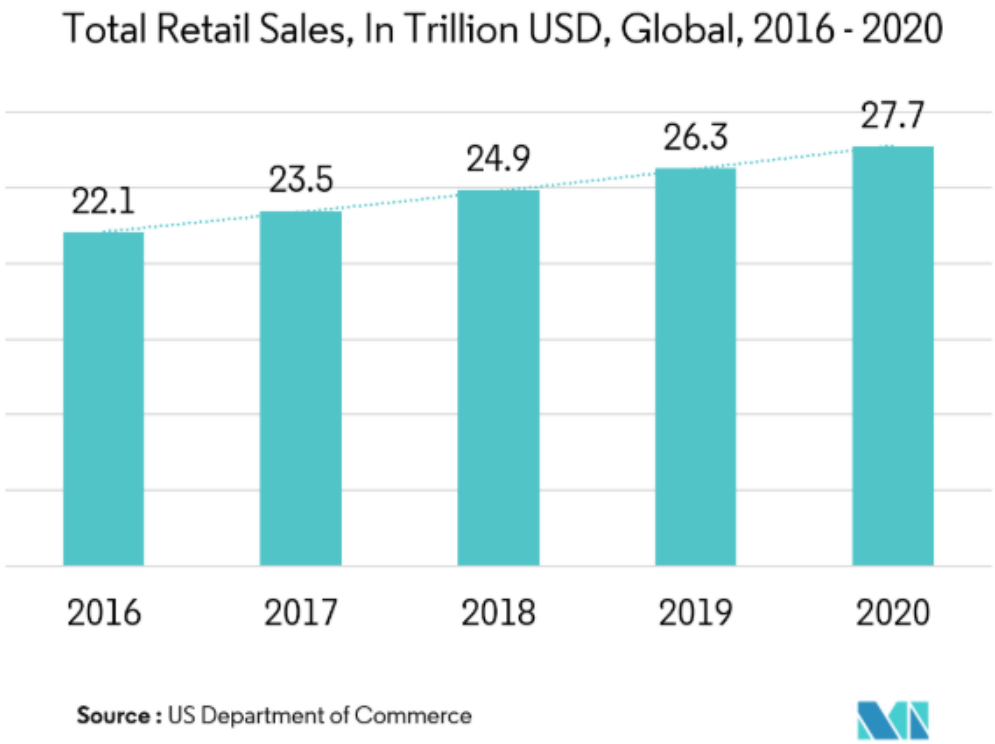
Game Design 101

The true power of game design in training is its ability to create the motivation to improve.

Game Design in Everyday Life

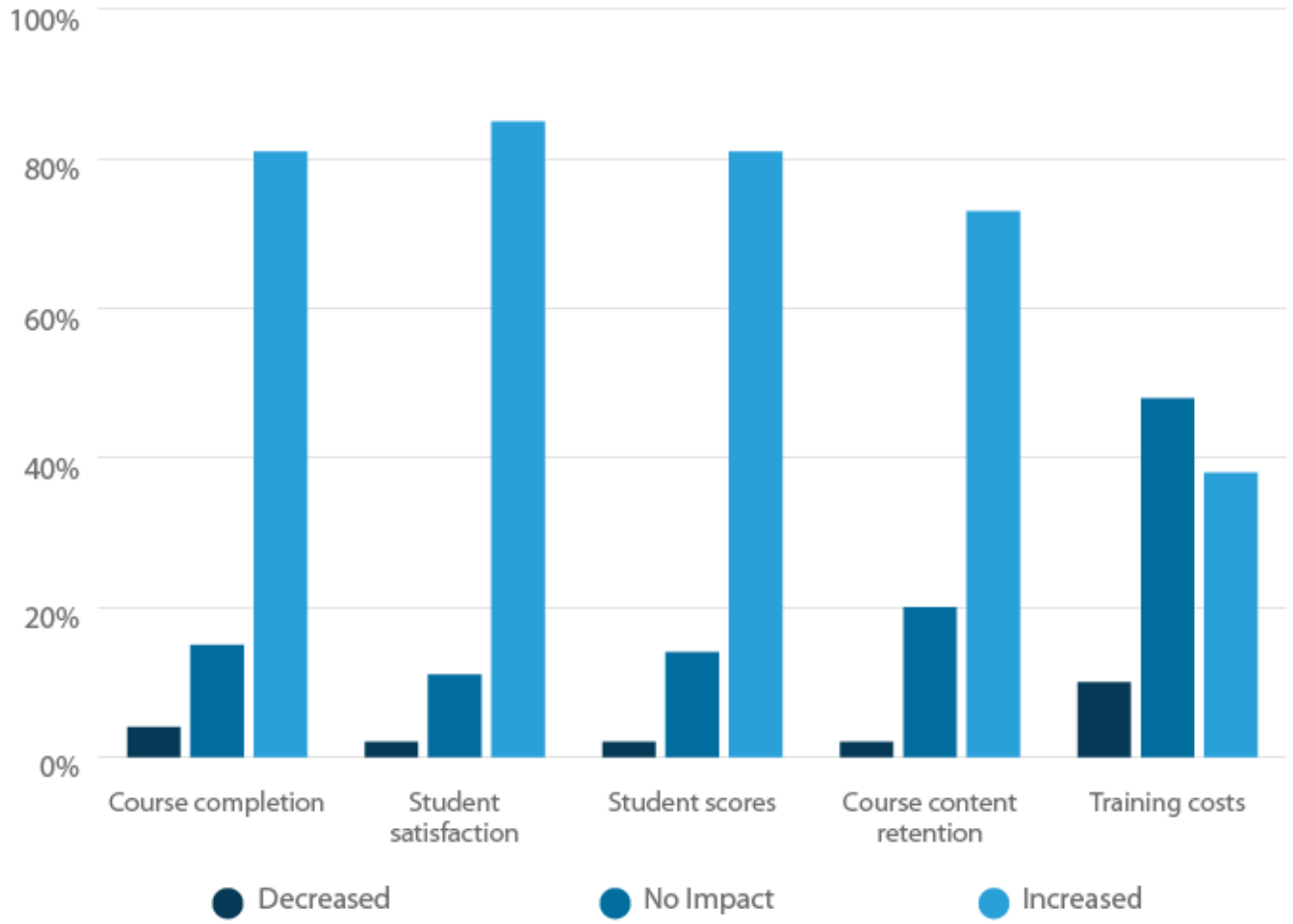
- Engagement is critical in knowledge transfer and retention.
- Fundamentals of game design are valuable in everyday life.
- The power of games in a nutshell:
  - “Last one in is a rotten egg!”

The Rise of Gamification



https://www.mordorintelligence.com/industry-reports/gamification-market

The rise of Game-Based Learning



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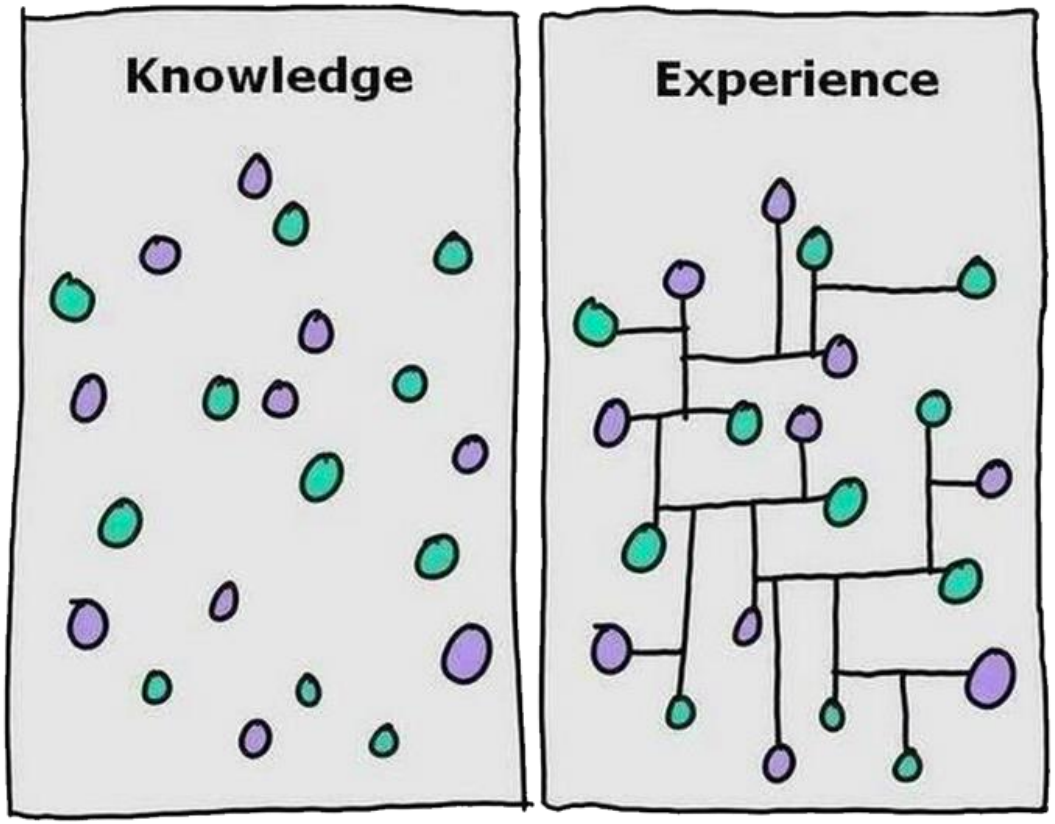
https://www.capterra.com/learning-management-system-software/lms-gamification-research

Why Game-Based Learning Works

- Learning from failure
- Active vs Passive Learning
- Context before knowledge
- Ah-ha moments
- We are built to play!

http://pixdaus.com/learning-by-doing/items/view/75833/

Why Game-Based Learning Works



http://flowpro.io/solutions

Game Design 101

A game is a **system** in which players overcome **challenge,** bound by a set of **rules** and has **quantifiable outcome**.

Game Design 101

- How these elements apply to Flight Training:
  - **Systems**
    - Aircraft & Airspace
  - **Challenge**
    - Maneuvers
    - Stage checks
    - Check ride.
  - **Rules**
    - FAR/AIM
  - **Quantifiable Outcomes**
    - ACS

http://www.gonuldergisi.com/wp-content/uploads/2017/03/67-oyun.jpg

Game Design 102 – Game Loop

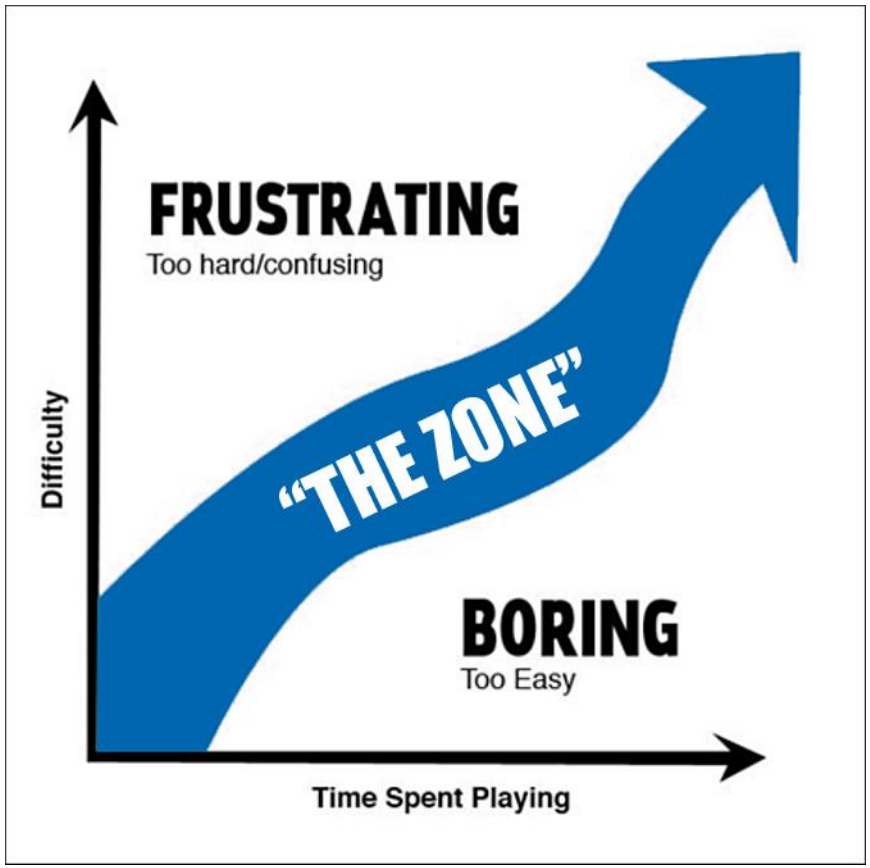
Game Design 102 – Game Loop

Game Design 101

Game Mechanics are the building blocks of games.

Game Design 102 - Difficulty

- Too hard = Frustrating
- Too easy = Boring
- Just right = In the Zone



http://www.razeyourgame.com

Game Design 202 - Mechanics

- These mechanics can be part of your toolbox to drive student engagement:
  - Interest Curves
  - Surprise
  - Clear Goals & Measures
  - Problem Solving
  - Curiosity
  - Chance
  - Meaningful Choices
  - Story
  - Visible Progress
  - Reward

Game Design 202 - Mechanics

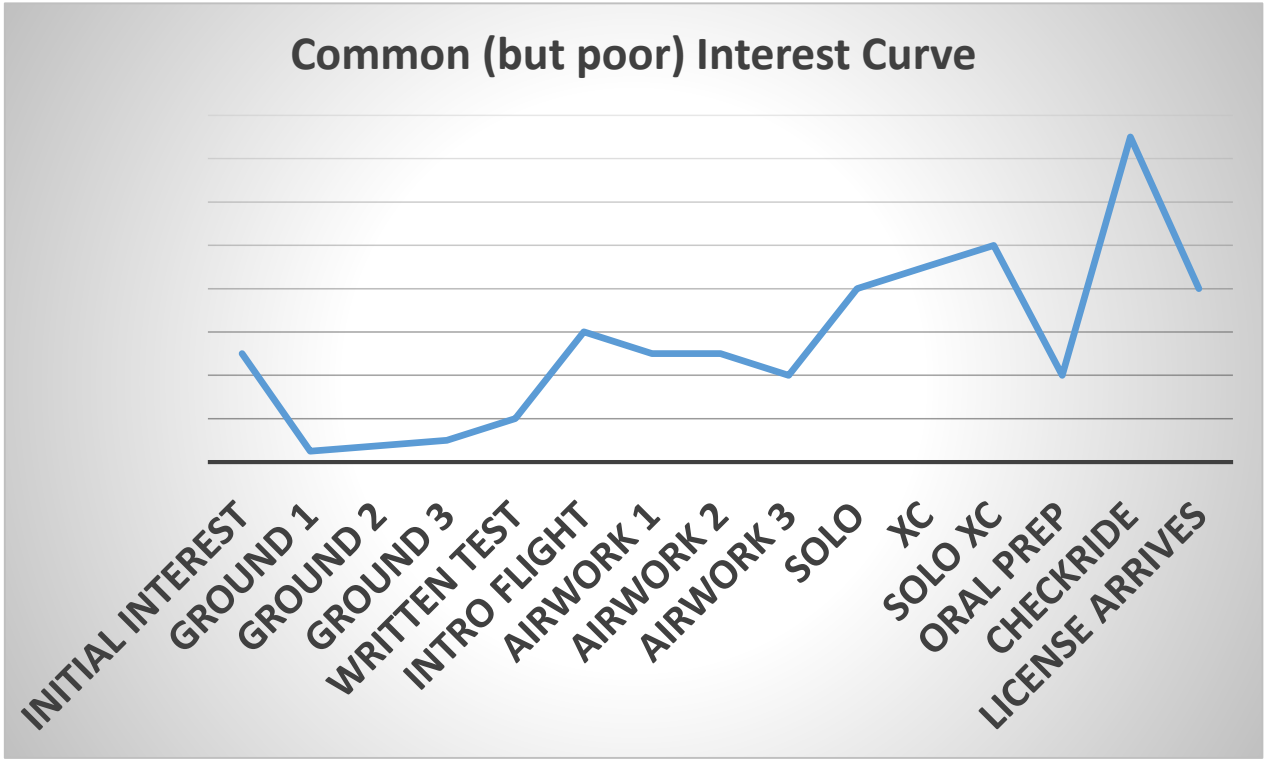
- Interest Curves

A structure of variable tension to maintain & build interest.

https://genchevblog.wordpress.com/

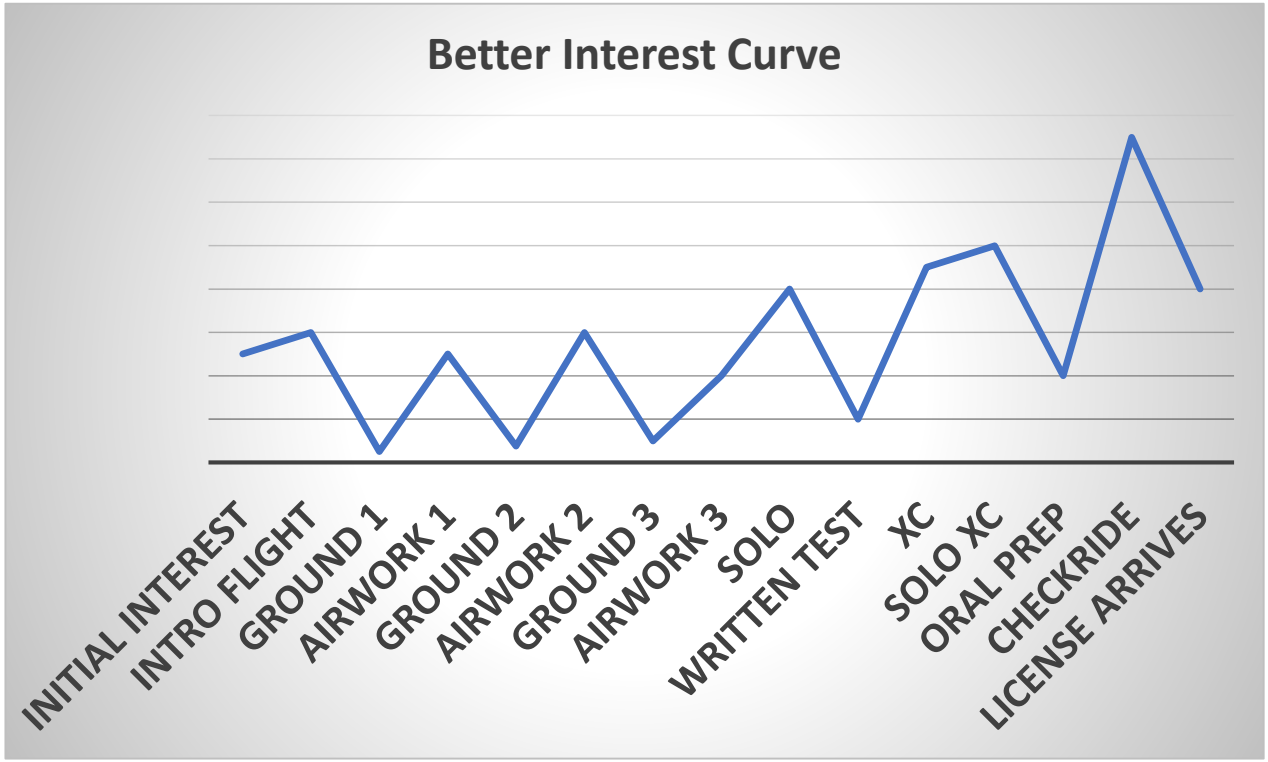
Game Design 202 - Mechanics

- Interest Curve – Current Training Process (not ideal)



Game Design 202 - Mechanics

- Interest Curve – Better Training Process?



Game Design 202 - Mechanics

- **Surprise** – Something unexpected
  - Engine out in the Pattern
  - Diversions
  - Go-Around

https://commons.wikimedia.org

Game Design 202 - Mechanics

- **Curiosity** – The desire to know, often unusual
  - Visit unique local airport
  - Try out techniques seen online
  - Give them some control over training

https://commons.wikimedia.org

Game Design 202 - Mechanics

- **Problem Solving** – Finding solutions
  - Let them figure it out on their own.
  - "Hey Mark, what altitude should I fly at?"
    - What do you think?

https://www.marketingprofs.com/marketing/online-seminars/500

Game Design 202 - Mechanics

- **Clear Goals & Measures**
  - Everyone wants to know they're doing!
  - ACS provides this, but often not top of mind.
  - Stay objective!

https://pixabay.com/illustrations/goal-setting-goal-dart-target-1955806/

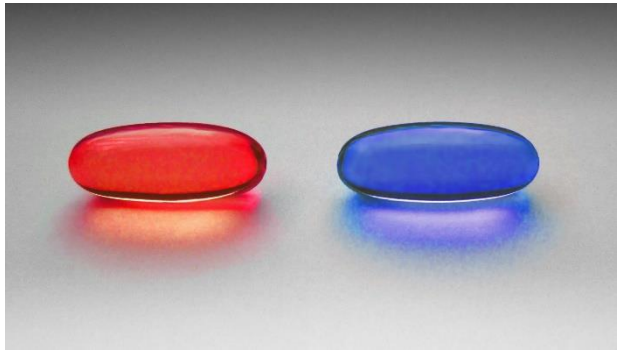
Game Design 202 - Mechanics

- **Chance** – The possibility unknown events
  - Inherent in training:
    - Weather
    - NOTAMS
    - Maintenance
  - Letting chance happen
    - Weather safe but iffy?
    - Opportunity to fly a new type

https://www.flickr.com/photos/14616064@N06/

Game Design 202 - Mechanics

- **Meaningful Choices –** Have Possible Outcomes
  - The go-no-go
  - Turn back due to weather
  - Routes when flight planning



https://en.wikipedia.org/wiki/Choice

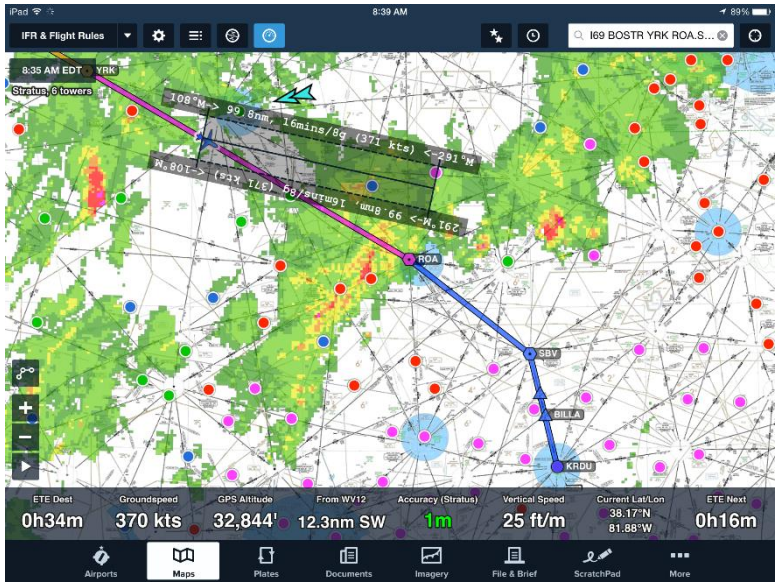
Game Design 202 - Mechanics

- **Visible Progress** – Where am I in this process?
  - Pull out the syllabus and mark it off!

www.nickshubin.com

Game Design 202 - Mechanics

- **Story** – An account of events, real or imagined
  - Scenario Based Training
  - Practicing part of a cross-country flight before diverting to the practice area.



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ipadpilotnews.com

Game Design 202 - Mechanics

- **Reward** – Recognition of effort and achievement
  - Verbal praise
  - Spruce Goose Cafe at Jefferson Co (0S9) has great pie!
  - Airport they want to visit
  - Flight over interesting place
  - cross-country route

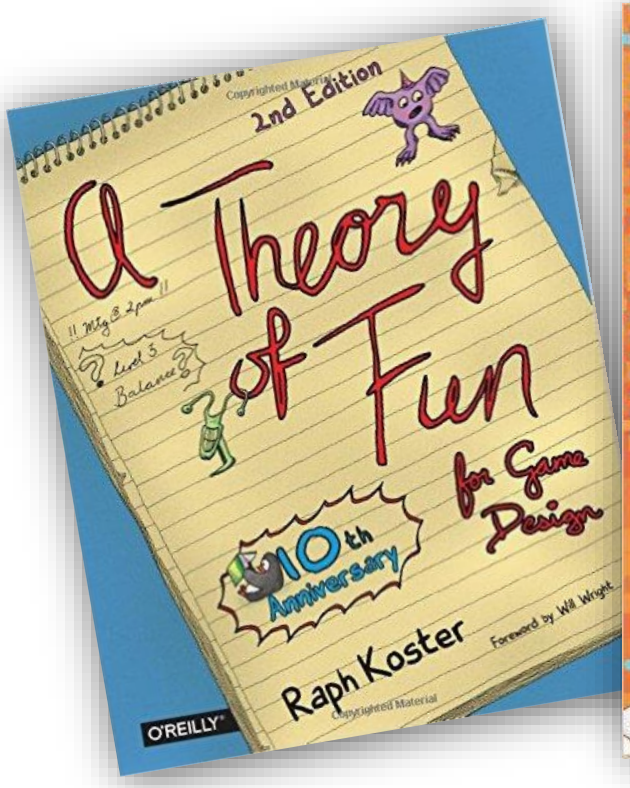
https://www.youtube.com/watch?v=xogCGINfsEU

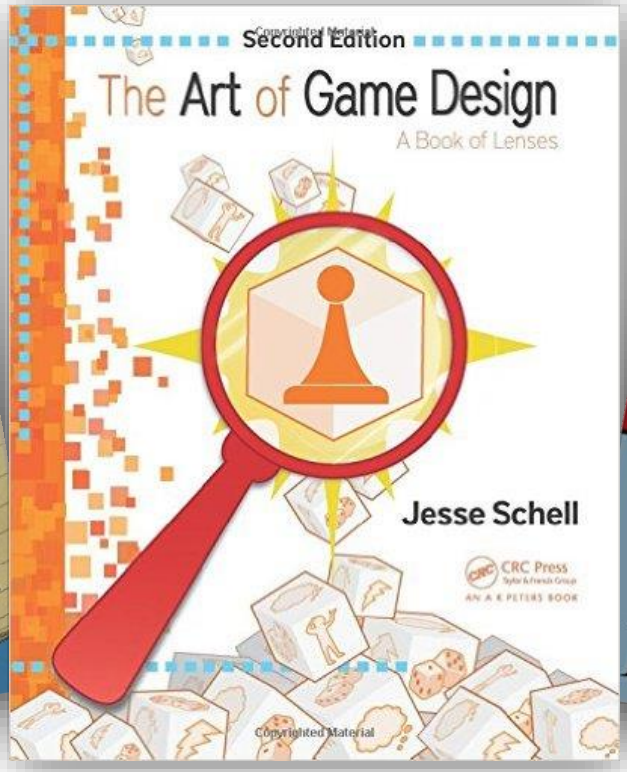
Game Design 202 - Summary

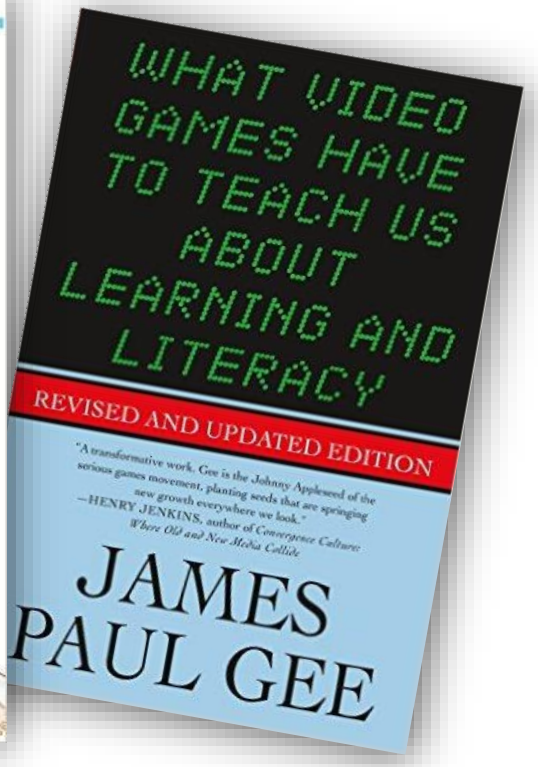
- Understanding game design and mechanics provide tools in your CFI toolbox to drive engagement, fun and keep students on track to certification, and create safer and more capable pilots.

  - Interest Curves
  - Surprise
  - Clear Goals & Measures
  - Problem Solving
  - Curiosity
  - Chance
  - Meaningful Choices
  - Story
  - Visible Progress
  - Reward

More on Game Design?







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Intro to TakeFlight

TakeFlight® INTERACTIVE

Lowering the barriers to aviation for all

LIVE

Intro to TakeFlight Interactive

- Our Vision
  - Teach fundamentals in a standardized way
  - In a high repetition and cost effective environment
  - So that the aircraft can be used for more advanced concepts
  - To create safer more capable pilots

Intro to TakeFlight Interactive

It’s tempting to be skeptical of untried technologies, but we must be visionary in assessing, adapting, and accepting them. **– Greg Brown**

Intro to TakeFlight Interactive

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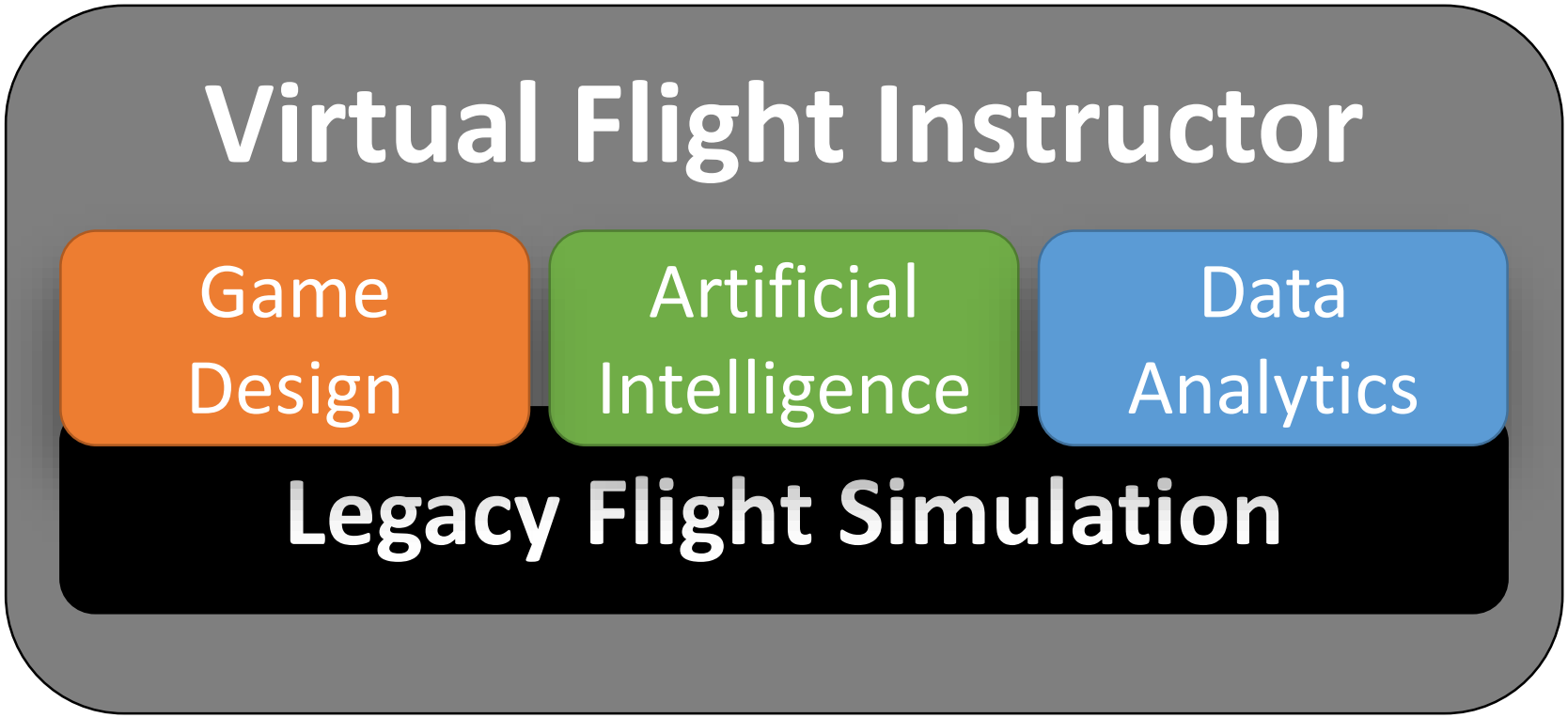
Intro to TakeFlight Interactive



TakeFlight Academy

TakeFlight Academy

A self-guided simulation training platform

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TakeFlight Academy

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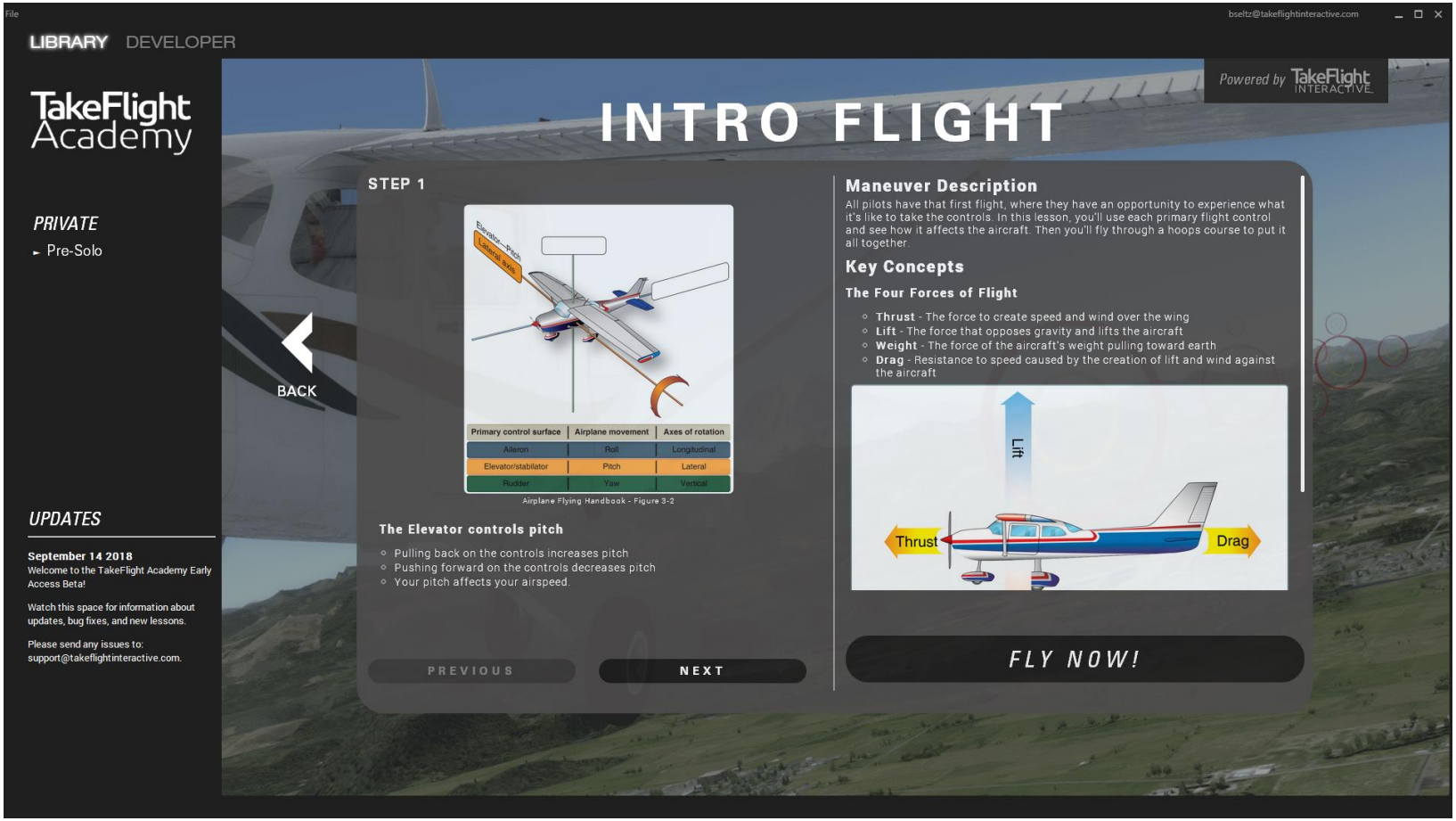
TakeFlight Academy



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TakeFlight Academy

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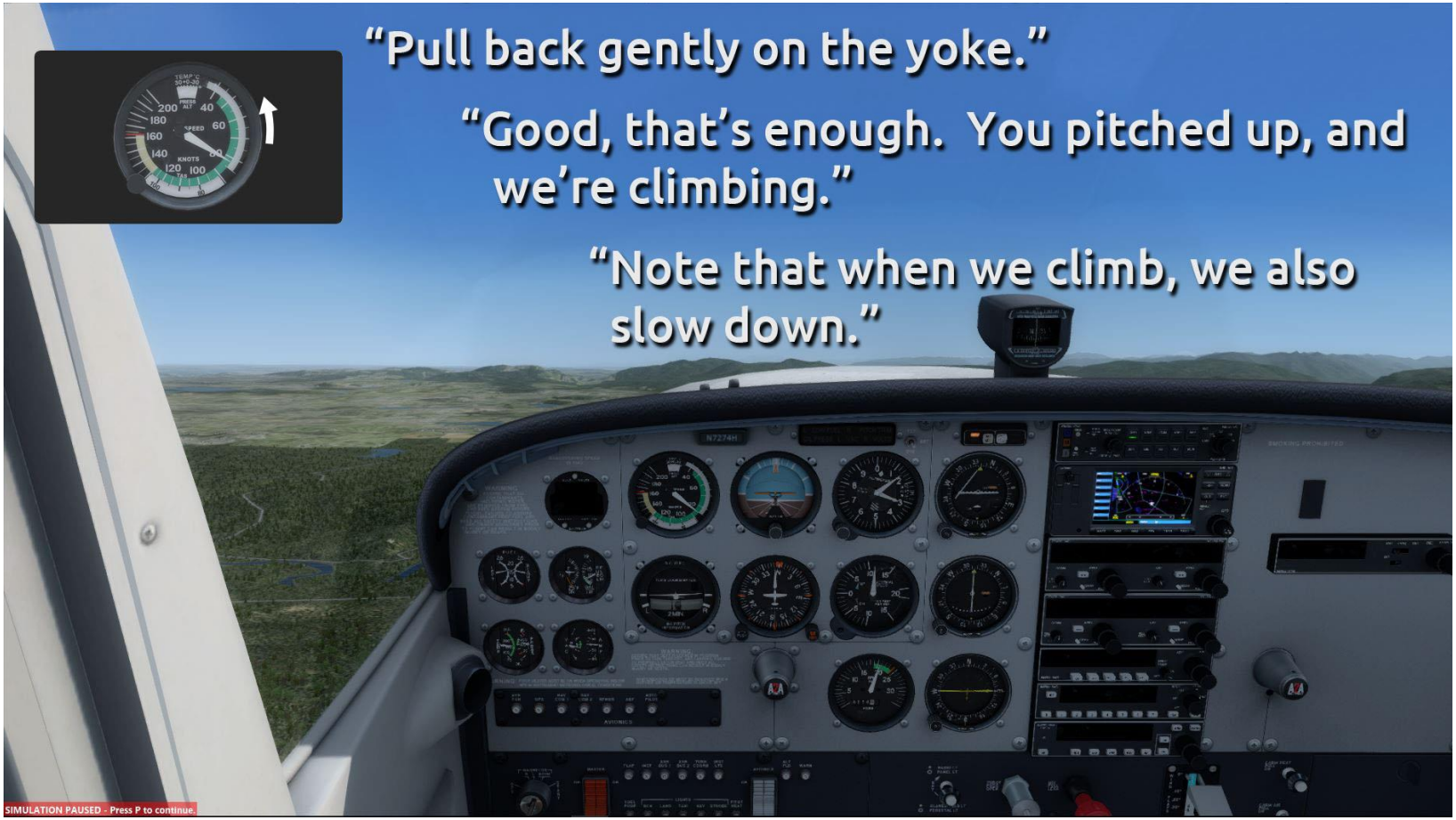

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TakeFlight Academy

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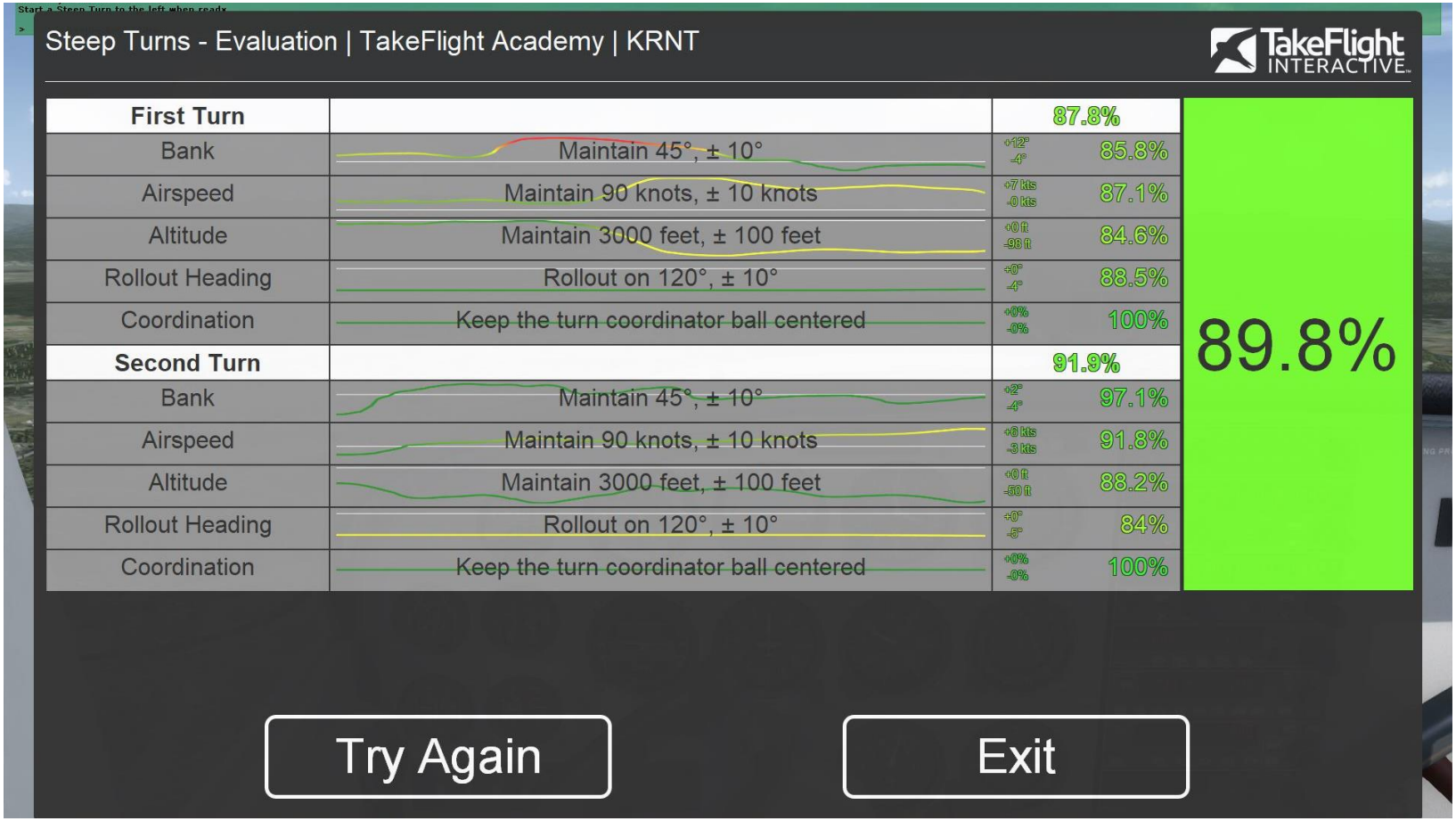

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TakeFlight Academy

LIVE

Alaska Airlines/TakeFlight Interactive Solo Academy

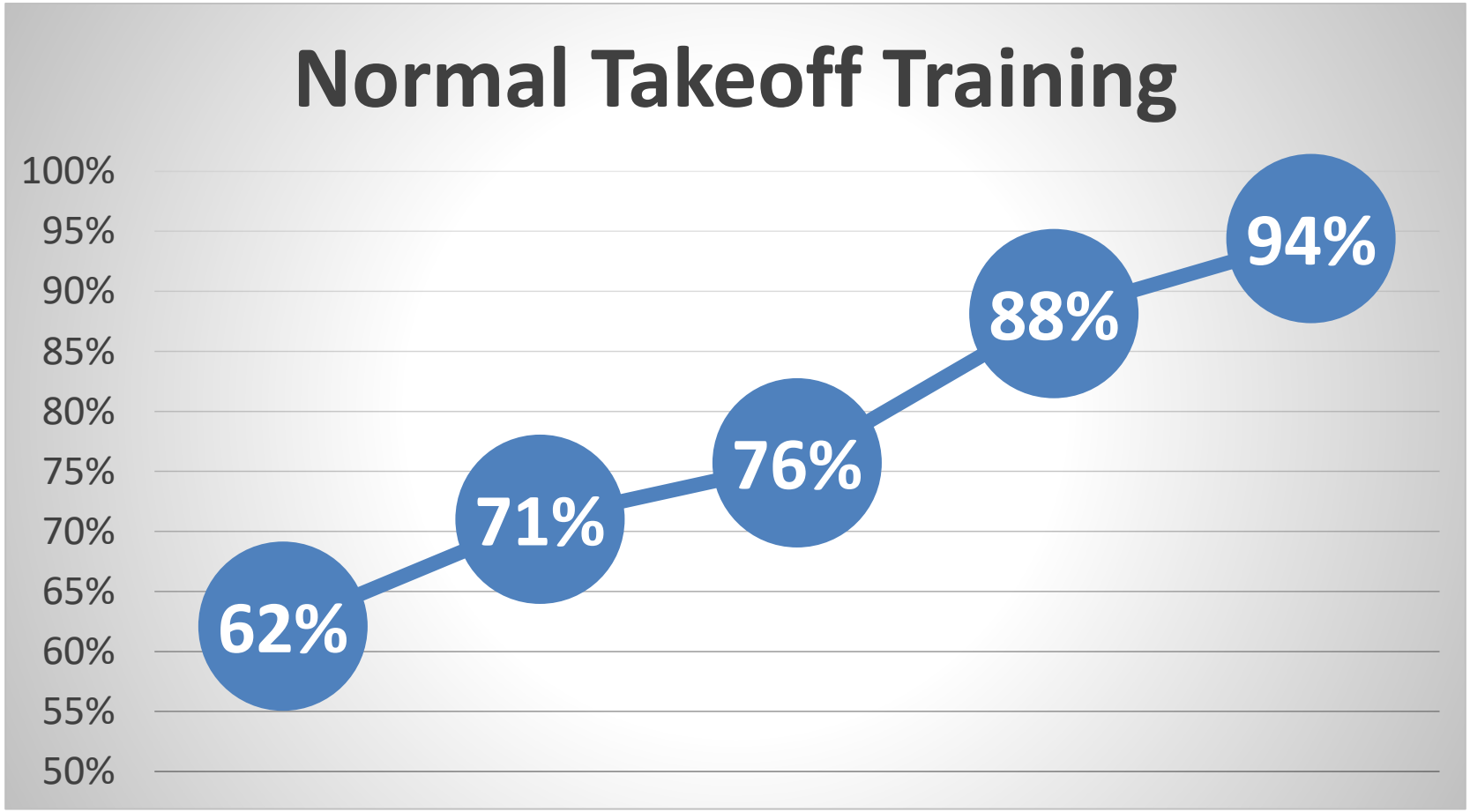
Solo Academy

LIVE

Solo Academy

LIVE

Solo Academy



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Solo Academy

Soloed 4**0% faster** than those not using TakeFlight

LIVE

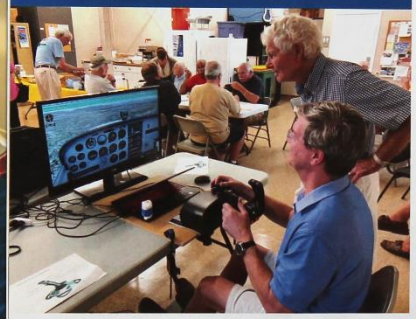
EAA – Virtual Flight Academy

MEMBERCENTRAL
MEMBERS/CHAPTERS IN ACTION

EAA Virtual Flight Academy Takes Off at Chapter 1067

BY BRANDON SELTZ, EAA 1274869, TAKEFLIGHT INTERACTIVE FOUNDER AND CEO

CHAPTER 1067 HAS BEEN developing strategically in recent years. A refreshed crop of volunteers have revitalized chapter meetings with regular presentations and are now holding monthly Young Eagles rallies. The chapter is about to occupy its own hangar for the first time and is putting together a youth build program. It is also one of the first chapters to see how successfully it can integrate EAA's Virtual Flight Academy (VFA) into its activities.



Chapter members pulled together an old laptop computer they had lying around, installed Microsoft Flight Simulator, and connected a $35 Logitech joystick. They also brought a more powerful laptop with a modern graphics processor, which they outfitted with a yoke and pedals.

Starting with the September meeting, the chapter introduced the EAA VFA program to members, bringing both simulators for test flights of the VFA's virtual flight instructor — the heart of the new EAA member benefit. Member tests of their virtual instructor-assisted flying skills yielded enthusiastic results. There was plenty of merriment as pilots looked on as their friends got used to the simulator and saw their performance scores.

At the September Young Eagles rally, two simulators in similar configurations were used. This time, they were able to see how Young Eagles would respond to the Aviore-inspired Young Eagles version of VFA. The response was no surprise: kids grinning from ear to ear, beaming when they saw how well they performed. The chapter did the same exercises during the October members meeting and Young Eagles rally. This time, one of the members brought a 40-inch TV, which added to the fun at no cost. The TV is a breeze to connect with an HDMI cable, and then you just need to configure the TV for that video source. Again, the results were fun, enthusiasm, and group engagement.

In the EAA Virtual Flight Academy, the primary focus was on two of the six available maneuvers: the introductory flight and the normal landing. These provide distinct accomplishments for young flyers to focus on. The introductory flight has an especially fun element: after the orientation segment, young flyers run an aerial hoop course in which they fly through concentric circles along a serpentine flight path. It's a real crowd-pleaser and a perfect way to challenge and evaluate just-acquired flying skills.

Something unexpected and delightful happened at the October rally. One of the parents indicated a past interest in a flying career but noted that cost and family obligations got in the way. After watching the Young Eagles on the simulator, he asked if he could dive in, which he did — with gusto. He graciously gave up the controls when the next Young Eagle arrived for his turn, but it was obvious he would have flown the entire day if he didn't need to take his family home.

The best part was that the rally itself was transformed. Young Eagles events always require extra effort to keep the kids engaged while waiting for their flights. Too often the hangar feels like a waiting room and not terribly exciting for high-energy kids as they wait for their name to be called. But with the VFA running in the hangar, now there are flights happening on the ground, not just in the air. More than a few volunteers remarked how much — and how positively — it changed the energy of the rally.

Young Eagles eat this stuff up. They gain these flying skills quickly — far faster than most adults. Several got scores in the 90th percentile after only a few tries. The VFA also gives young people a way to continue engaging with aviation beyond the first Young Eagles flight. When they come back to the chapter having high scores on the maneuvers, the chapter would be more than happy to give them an additional Young Eagles flight.

"The EAA Virtual Flight Academy, along with Sporty's Private Pilot Ground School, our Young Eagles flights, the opportunity to actually build an airplane, and the mentoring from our many qualified and experienced members, will allow us to create a more complete career-focused aviation program for our local young people," said Chapter President Joan Zaleski, EAA 1191719.

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EAA – Virtual Flight Academy

LIVE

Civil Air Patrol

LIVE

The Next Generation of Aviators

- No barriers to technology
- Already playing games
  - Why not learn to fly while they're doing it?
- Greatly increased access to training

The Next Generation of Aviators

LIVE

Sim for Primary Training?

- Simulation not for Primary Training?
  - Mainly for IFR due to?
  - We're interested in your opinions in Q&A!
- Why now?
  - Computing power
  - Increased visual realism & larger displays
  - Better simulation fidelity
  - New capabilities in AI and Virtual CFI

Understood Limitations of Sim

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Benefits for the Student

- Primacy
  - What's learned first is best remembered
- Availability of Training
- Efficiency
  - Less time in the aircraft focusing on maneuvers
  - Lower costs = higher completion rates
- More fun!
  - Increased confidence in the aircraft is more fun.

Benefits for the Instructor

- Primacy
  - Overcoming primacy is very difficult
- Better Prepared Students
- Increase Completion Ratio
- Higher Instructor/Student Ratio?

Benefits for the Flight School

- Happier Customers
  - More Business via Social Media
  - Higher completion rates
- Simulator Rentals
  - Higher profit margins
  - When the weather isn't conducive to flying
- Better visibility in Student Progress

How can I Integrate this Tool?

- How can I use this tool?
  - Student who is interested, or looking to get started
  - Homework before a flight lesson
- What do I need to get started?
  - PC – Gaming PC with dedicated graphics card.
  - Flight Controls (Joystick/Yoke)
  - Lockheed Prepar3D
- Questions for us?
  - support@takeflightinteractive.com

Other Great Sim Tools

- pilotedge – Human ATC for flight simulation
  - AIN Article – Learning to Fly on Simulated Wings

https://www.ainonline.com/aviation-news/general-aviation/2019-01-29/learning-fly-simulated-wings

Conclusion

- Using game design techniques can help you keep your students engaged and on-track to certification.
- New tools can transform the training process, getting students to certification with more knowledge, experience, creating safer and more capable pilots.

Questions

Thank you!

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