

Innovative Flight Simulation Experiences for Students and Teachers

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DRL Grant # 0929609



Challenges

STEM Classroom Challenges

- Motivation
- Engagement

Objectives

- To improve the overall ability of students in solving real life problems.
- To improve the attitudes of teachers and students towards teaching and learning Mathematics and Science concepts.
- To increase the number of teachers who are trained to teach Mathematics and Science concepts with innovative, active, and experiential teaching techniques through modern technologies.
- To provide service-learning and mentoring opportunities to Tuskegee University undergraduate students and experience working in a multi-disciplinary project

Participants

- Predominantly African-American
- 10 teachers/year in two yearly workshops
- 20 students/year in three yearly workshops
- 60 students/year in class rooms in the third year of the project and subsequent years

Flight Simulation Environment



Immersive; Realistic; Engaging

Hardware

Large Screen Setup

- Four PCs
- Three LCD projectors, and one 19in LCD Monitor
- Yoke, rudder pedals

Software

- MS FSX
- Flight Data Recorder
- FSUPIC
- Wideview

Hardware & Software

Desktop Version

- PC
- Joystick
- MS FSX
- Flight Data Recorder
- Excel



Students Summer Camps

Teachers Professional Development

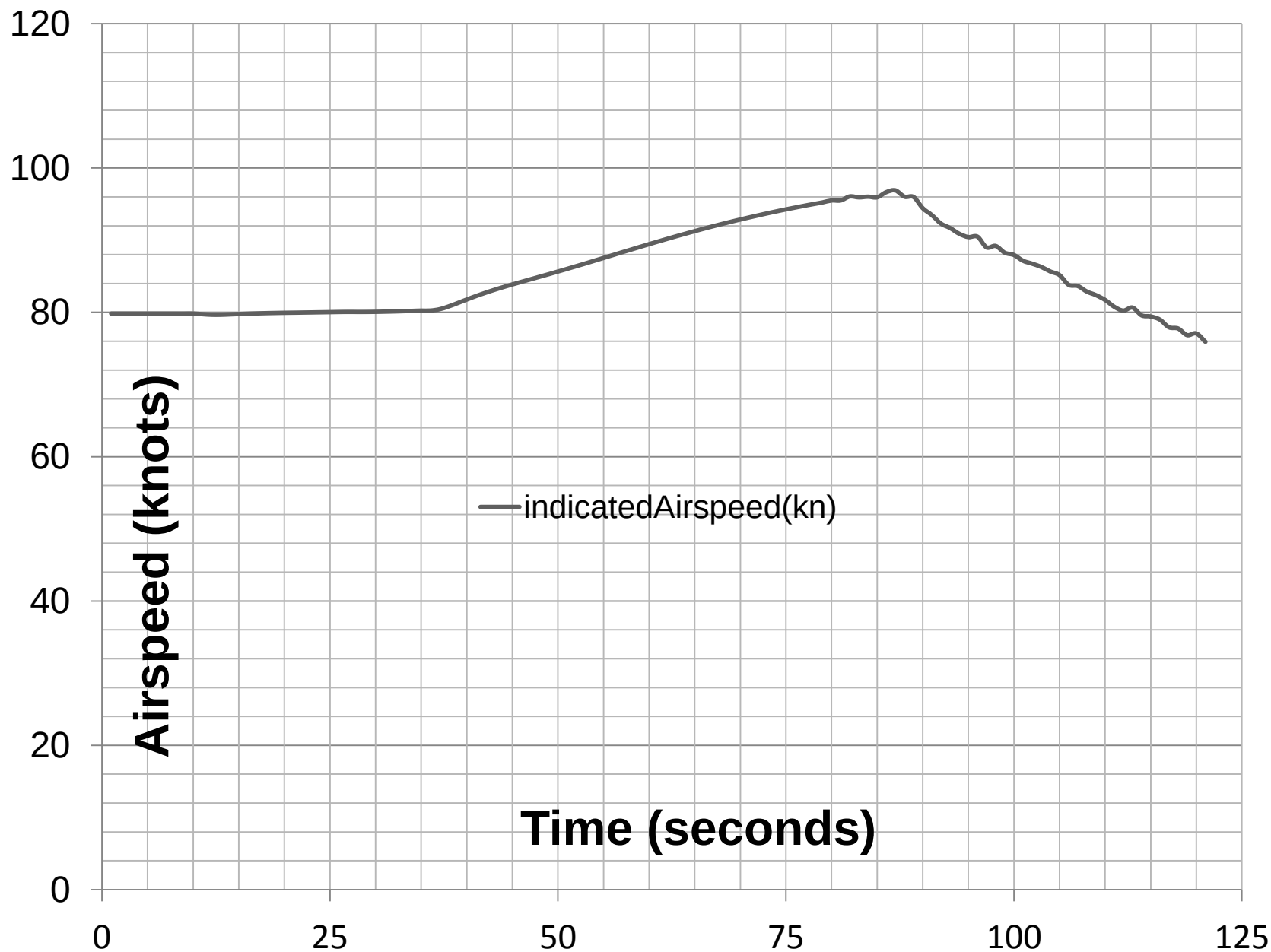
- Duration: 4 days PD and 5 days SC
- Content
 - Physics of Flight
 - Slopes, Similar Triangles
 - Excel (using formulas, graphing)
 - STEM enrichment talks
- Pre-post
 - Science & Math Attitude scales
 - Content (registered statistically significant improvement)

Learning Modules Developed

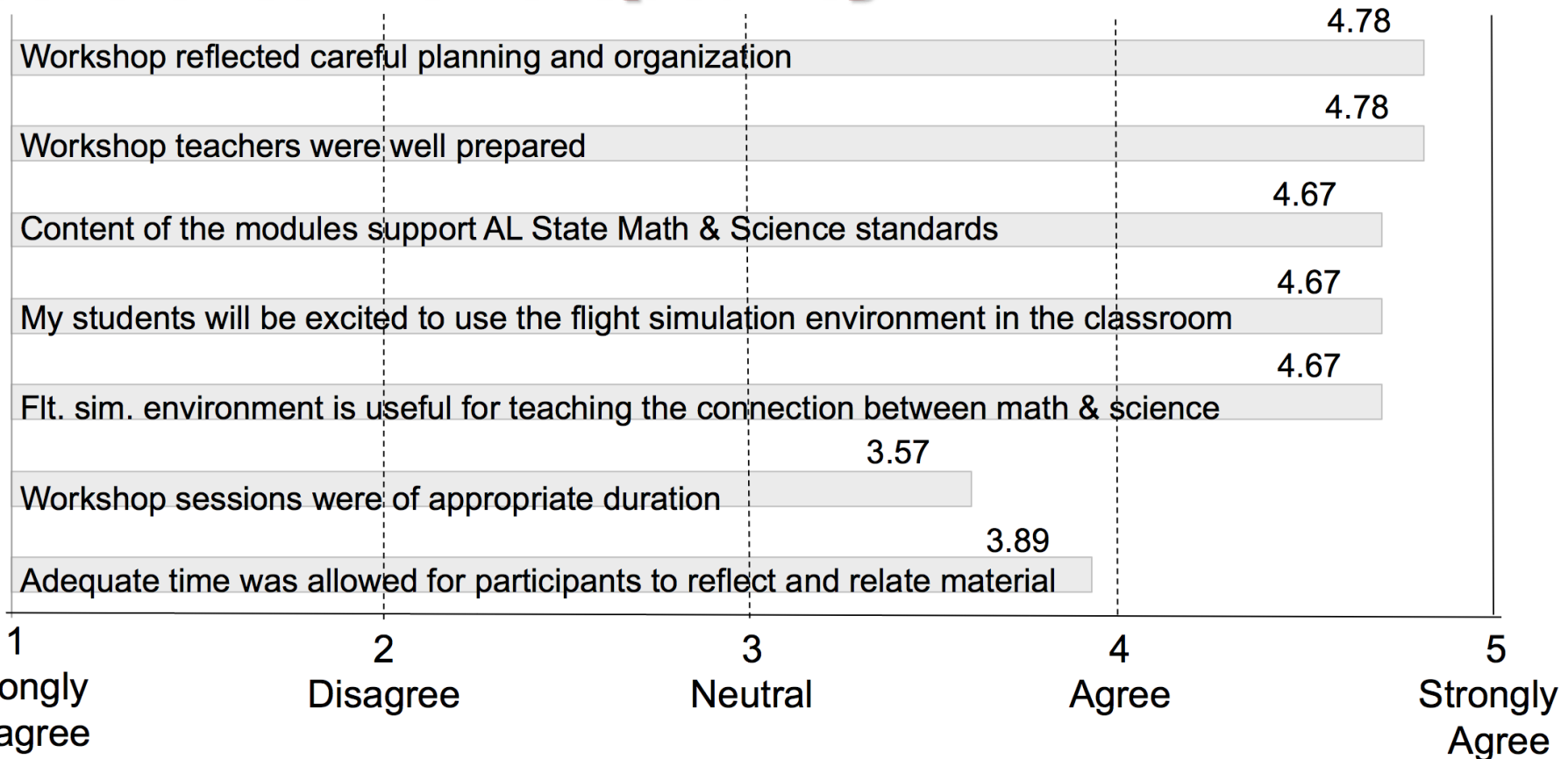
- Slopes, Rates, Acceleration, Deceleration
- Circles, radii, circumference
- Similar triangles
- Vectors etc.

We will be increasing and decreasing the engine power during this mission. Don't worry about maintaining your altitude, I will do that for you.





Teachers Post Workshop Survey



What did you like best about the workshop? **Information provided and hands-on activities.**

Would it be useful to offer a follow-on refresher course during the school year? **Definitely Yes.**

What areas would be most helpful for a refresher course? **More practice using simulator.**

Current Status

- Deployed in two high schools since Fall 2014
- Teachers using in classroom



Questions