“LESSONS LEARNED”
From 2013-2014 PROGRAM

Shigeo Hayashibara
Associate Professor
Embry-Riddle Aeronautical University (ERAU) Prescott, AZ
Boeing AerosPACE: the Concept
(from: Boeing LTD 2014 Executive Summary)

Mission Statement: A multi-disciplinary, multi-university collaborative capstone program bringing together stakeholders from industry, academia and government to build core competencies for the next generation of aerospace innovators in a sociotechnical, collaborative environment founded in the learning sciences.

Vision Statement: Develop a capstone engineering design course that motivates students to enter the aerospace profession and fills gaps in student competencies using latest research from the NSF I/UCRC Center for e-design and industry.

What are students doing? Multi-disciplinary teams with students and faculty from multiple universities and majors are collaborating to design, build, and fly a blended wing body UAV that can monitor agricultural fields to help improve crop yield for a growing global population.
Boeing AerosPACE: the Approach

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Boeing AerosPACE

- Educational Improvements “Learning to Learn”
- Industry-Academia Collaboration “Knowing what to learn”
- Novel Manufacturing Processes “Learning by Doing”
- Novel Collaborative Tools “Learning to work together”

STEM Pipeline
- Distributed Learning
- Teamwork
- Mentor/Mentee Relationships

Advanced Manufacturing
- Additive Manufacturing
- Distributed Manufacturing
- Hands on experience

Engineering Education Research

Stakeholders
- The Boeing Company
- Universities
- Partners

Collaboration
- NX Connect
- CorpU
- Multidisciplinary Students
- Crowdsourcing

(from: Boeing LTD 2014 Executive Summary)
“CorpU” Teaching / Learning Tools

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Lectures and Labs

- Screen Sharing
- Online Meeting
- Recording
- Chat

Software Tools

- Siemens NX
- Siemens Teamcenter
- Star CCM+
- ANSYS
- NASA Tools
- Microsoft Office

Students

- Google Hangout
- Google Drive
- Dropbox
- Skype
- TeamViewer
Opportunities for Students

- Boeing subject matter specialists are the project coaches of each student design team
- Multi-university faculty collaboration and support for student project and associated academic research
- Strong networking with Boeing engineers, students, and faculty members of multi-universities through distant collaboration across the nation
- Strong employment opportunities: students are well trained in “Boeing Style” of doing engineering
Major Challenges (1)

- **Project team formation**: teams of multi-university students and faculty members with industrial partners
- Lecture, lab, and meeting schedule **mismatch**
- Leadership and organizational report structure
- Project milestone vs. school’s academic schedule
Major Challenges (2)

- Western v.s. Eastern schools (Time Zone / Culture)
Major Challenges (3)

- Development of relationships and trust...

...in ONLINE COMMUNICATION ONLY?
Major Challenges (4)

- Distributed manufacturing
- Fabrication, assembly, and testing logistics
- Budget distribution for each school
• So, how did our students handle this project? Everything was their “first time” experience . . .
• Embry-Riddle’s 5 students joined into 2 teams:

TEAM 2 (Brigham Young Core)
• An ERAU student takes leadership role
• “Collaboration in Fabrication of Aircraft”

TEAM 1 (Georgia Tech Core)
• “Auto-Pilot System Development & Integration”
2013-14 Boeing AerosPACE: Team 2
(Brigham Young CORE)
ERAU Students in Team 2 (BYU)
2013-14 Boeing AerosPACE: Team 1
(Georgia Tech Core)

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Enrique C.
BYU

Chris D.
ERAU

Rachel E.
ERAU

Spencer H.
G.A. Tech

Bennett M.
BYU

Kevin M.
G.A. Tech

Tom N.
G.A. Tech

Chief Engineer

Sean S.
G.A. Tech

Mark S.
G.A. Tech

Andrew W.
ERAU

Amelia W.
G.A. Tech

Project Manager

Andy Yu
Purdue
ERAU Students in Team 1 (Georgia Tech)
Success in Engineering Education?

- Development of “Teamwork”?  
- “Real-World” Experiences?  
- Needs from industry (Boeing)?  
- Be an Engineer . . .
Still Some Issues to be Addressed . . .

- Establishment of long-term visions and goals . . .
- Assessment of the capstone design project: based on ABET outcomes criteria
- Allocations of proper budget and resources for each multi-university design team
- Development of more effective engineering team work environment (Face-to-Face Kickoff)
- Elimination of school v.s. school competition mindset (who’s better or worse?)
- Main purpose: education (capstone) v.s. academic research . . .
Boeing Flight Demo: April 2014

TEAM 1: AGUAS (at Georgia Tech)

TEAM 2: MAVERICK (at BYU)
Boeing Aerospace

Aerospace Partners for Advancement in Collaborative Engineering

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