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Implementation of Team-Based Learning in Aviation Education

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Team-Based Learning in Aviation

Austin T. Walden, Ph.D.



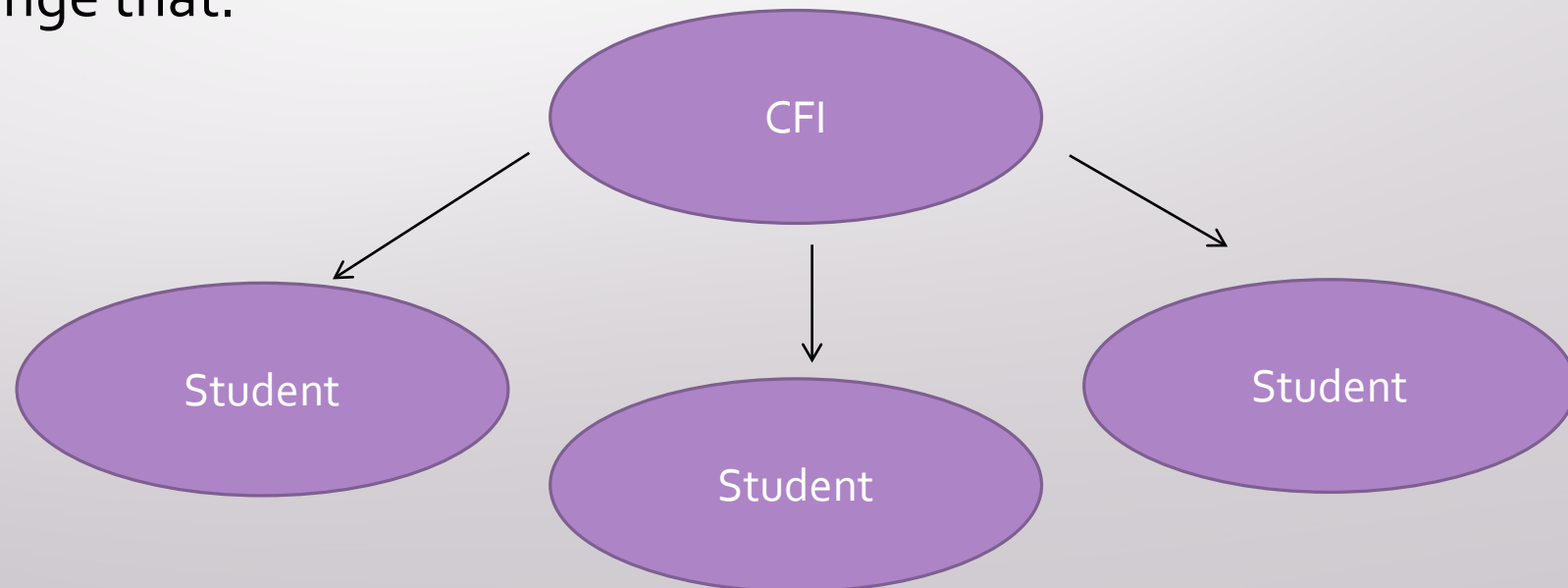
My Observation

Although Part 141 flight schools are getting larger, and there is a large demand for pilots today, but I still see aspects of aviation education being a “solitary endeavor.”

Flight lessons are given one on one. Trust is built between CFI and student. They become the progeny of that one particular CFI, and to a lesser degree of the school they spent their time.


The Benefits of Interaction

- My observation: When I first arrived at my new school, students were essentially siloed. CFI's controlled the knowledge given, and students interacted primarily with their CFI.
- I knew I wanted to change that.




Team-Based Learning

- Team-Based Learning has come to prominence in a variety of disciplines including STEM education and the Humanities. I've personally used it in Aviation, Political Science & Psychology courses.
- Team Based-learning incorporates:
 - Small Team Environments
 - Individual Test Taking
 - Team Based Test (Quiz) Taking.
- Social benefits include development of organic bonds between students and faculty, higher retention rates, and increased patterns of adaptive learning.



Essential Elements of TBL (Michaelson & Sweet, 2008).

- Teams
 - How you break them into teams
- Accountability
 - Personal and group accountability through grades
- Feedback
 - Immediate discussion of the right & wrong answers after team quiz



How it works in MY Private & Instrument Ground

Ground instructor lectures on the topic.

Let's say "Aircraft Systems"

The FOLLOWING week

- The following week, the Instructor gives a quiz on Aircraft Systems.
- Note:
 - The instructor has lectured on the material.
 - The students had an entire week to study for the upcoming quiz.
 - Where does the quiz come from? ASA Prepware (but you can use whatever !)

Students Take the Quiz

- During the first 15 minutes of class, students take the 15 question quiz on Canvas.
 - Why canvas? Models them taking a written test for the FAA.
- I do not let them see the correct answers or responses, but they do know how well they did (8/15 or 13/15 etc)

Team Quiz

- Students take an IDENTICAL quiz, with a new twist.
- NOW, they take it in a Team!
 - Team has been either randomly assigned by the Instructor, or is a continuation of Teams from previous weeks.

About the Teams

- I give out a Big 5 personality survey, as well as an experience survey at the beginning of class.
- That, in conjunction with my own evaluations, allows me to place the students in teams by the 2nd week of the semester.
- I then place students in teams. In my classes, each student will belong to 4 different teams throughout a 16 week semester.

The Role of the Instructor During a Team Quiz

- The Instructor does not answer any questions on the material.
- The students must choose the right answers based on:
 - Individual knowledge
 - Consensus building
 - Elimination of wrong answers
 - In-depth discussion

Competition: Who cares about teams?

- Students are highly motivated to be in a good team, because the teams compete for bonus points.
- The top 3 teams get bonus points!
 - High Scoring Team 1 – 3 extra points towards individual grade
 - High Scoring Team 2 – 2 extra points towards individual grade
 - High Scoring Team 3 – 1 extra points towards individual grade

The Grades

- The team grades can't save you, but they can help!
- If a student gets an $8/15$, but they are in the highest group, their score would be:
 - $11/15$
- If a student gets an $12/15$, but they are in the third place group, their score would be:
 - $13/15$

Scratch-Offs

- The hook for the team quizzes?
Gambling, essentially.
- I use these scratch offs, only for the team quizzes.
- There is an excitement to getting the right answer. And if they choose the wrong answer, it could put them behind another team who got all the right answers the first time.

IMMEDIATE FEEDBACK ASSESSMENT TECHNIQUE (IF AT®)
Name Team #3 Test # 2
Subject _____ Total _____

SCRATCH OFF COVERING TO EXPOSE ANSWER

	A	B	C	D	Score
1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4
2.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2
3.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
4.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
5.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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Quiz Questions Example

- 1. When flying HAWK N666CB, the proper phraseology for initial contact with McAlester Flight Service is**
 - A. 'MC ALESTER RADIO, HAWK SIX SIX SIX CHARLIE BRAVO, RECEIVING ARDMORE VORTAC, OVER.'
 - B. 'MC ALESTER STATION, HAWK SIX SIX SIX CEE BEE, RECEIVING ARDMORE VORTAC, OVER.'
 - C. 'MC ALESTER FLIGHT SERVICE STATION, HAWK NOVEMBER SIX CHARLIE BRAVO, RECEIVING ARDMORE VORTAC, OVER.'

- 2. The correct method of stating 10,500 feet MSL to ATC is**
 - A. 'TEN POINT FIVE.'
 - B. 'ONE ZERO THOUSAND, FIVE HUNDRED.'
 - C. 'TENTHOUSAND, FIVE HUNDRED FEET.' ...

What do the students say?

I really liked the weekly quizzes and I liked how you structured the class to cover the topics on the FAA exams.

Having a quiz every week helped ensure I retained the information presented and helped me to practice for my exams and the FAA Written

I like the daily quizzes and applying subject matter to activities in class.

Everyone is expected to participate in weekly lectures, group quizzes where knowledge or schools of thought can be shared, and are encouraged to think critically

I liked the group quizzes and assignments we did in class

I liked the group quizzes and hands on teaching

I was scared to share how much I didn't know, but it turns out we were all learning together. We all had something to share to help our grade get better. I

What does the initial data say?

- Written test scores: 15 points higher
- Number of Students Who Take the Written after the semester: 95%
- Initial pass rate for my 75 students: 100%
 - Includes students who haven't touched an airplane
- Comparison with other class? TBL students score higher

Challenges/Benefits

- Students love it. The quizzes each week give them stability. They know what to expect and when to expect it.
- As a teacher, I love it too. That quiz at the beginning of class allows me to organize my thoughts for the lecture. This could be a downside, depending on how much you have to cover.
- I really enjoy watching the students interact with each other and figure out an answers within their Team. Much more satisfying than me giving out every answer.
- Encourages self reliance.
- Anecdotaly, the “quiet” students don’t tolerate getting answers wrong for too long. They will “speak up” and be strong proponents for their team grades by week 3.

