

Fall 1999

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Scholarly Commons Citation

Smith, D. E. (1999). The Benefits of Experience in the Classroom. *Journal of Aviation/Aerospace Education & Research*, 9(1). Retrieved from <https://commons.erau.edu/jaaer/vol9/iss1/5>

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FORUM

THE BENEFITS OF EXPERIENCE IN THE CLASSROOM

Donald E. Smith

Occasionally in academic circles one hears how experience in the classroom is not important. Some would discount practical experience altogether. In some courses of study this may be true but in many technical aviation related courses, experience can be as valuable as the academic credentials. A good mix is ideal.

I could see I would overshoot the flight path of the bogey aircraft. I pulled harder. It felt like seven G's or so as I passed through his vortices and decelerated through transonic speed at the same time. The nose dug in. I knew I had just overstressed the jet. I overshot and he reversed into a horizontal scissors maneuver. Now it was simply a matter of whoever could slow down the quickest would win this fight. I turned off the roll augmentation. I was feeling the rudder pedal shaker and knew I was getting pretty deep into stall. As I slowed, wing rock and heavy buffet started. The angle of attack needle was just about pegged. It was all rudder now. I knew I couldn't even think about using lateral controls. We were rapidly descending through 10,000 feet. I didn't have much time as we were approaching the "hard deck" and in full afterburner burning 1500 pounds a minute I was rapidly also approaching bugout fuel. The bogey caved first. He called, "Knock it off" as his fuel reached a critical low. We looked each other over, formed up into a tight parade formation and headed back to the base for the debrief. I felt my wing lift slightly from his upwash as he settled into the tight formation.

The above is one of dozens of true stories I can relate to my Aerodynamics class. I can assure you I have their undivided attention. I can pose a host of questions from this short saga which relate to the academic material. What was my total energy? What was my dynamic pressure? Where was I on the V-n diagram as I overstressed the aircraft? What caused the bogey's wing tip vortices? Why were they more powerful than at one g flight? Why did my nose attitude increase as I decelerated through transonic speed? Where was my center of gravity? What happened to the aerodynamic center? Why would I turn off the roll augmentation making my jet less stable? Why couldn't I use lateral controls? Why was I able to continue fighting even though the aircraft was deeply stalled? Where was I on the thrust required/total drag curve? How much thrust was available at that altitude and low speed? Why was I in wing rock and heavy buffet? What was my angle of attack? How much lift was I developing? Why were we descending even though we were obviously nose high at high angles of attack? How much did the use of afterburner increase my thrust? At what cost? What caused the upwash I

felt during the tight formation flight?

My Embry-Riddle Aeronautical Science students tackle these real world problems with a renewed vigor. Most won't ever get to do that type flying but they sure dream about it. There are those who profess experience in the classroom is of no use and in some subject matter it may well be, but in this case, where we are dealing with the physics of flight, even though the jet may be outdated, the principles aren't.

Similarly, in my Aircraft Systems and Components course, I can pass on experience gained as a squadron maintenance officer, lessons learned from inflight system failures as well as relate what it is like to sit through a FAA four hour aural exam on aircraft systems and procedures. In the realm of navigation, I suspect I could come up with a full semester course on navigation mistakes I have performed or about which I have heard. The students could directly benefit and learn from my mistakes and hopefully avoid duplication of these at least embarrassing and sometimes deadly errors.

Occasionally, even what could be termed temporal subjects are best served by experience. Recently a president of a

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private southern college confided his fears that his board of trustees wanted to replace retired CPAs in his accounting department with PhD's. That particular department was one of the best in the country as evidenced by standardized testing. Accounting, especially with respect to the annual changes in the tax law, is probably one of the more dynamic courses in academia and one would think any experience brought to the classroom would quickly fade and be useless. This president however, was chagrined regarding the future of the accounting department as he anticipated the loss of his experienced CPAs. He predicted a downturn in the department's performance and lower scores on the standardized tests.

This treatise is certainly not a diatribe against those who have spent their entire professional career in academia. I hold them in the highest esteem for their perseverance and accomplishments. The point is a good mix of academic background and experience goes further in the classroom. I have monitored several highly technical aviation classes taught by pure academics. They know in depth, the math and

physics involved in teaching aerodynamics but that is all that gets across and the presented material is dry and unappealing. On the flip side of that coin I have also monitored classes taught by experienced aviators with what could be considered weaker academic backgrounds. "Sea stories" and purely practical applications predominate and the students walk away wondering what the purpose of the course was.

Again, a good mix is the key and a definite asset in the classroom. Making a technical or scientific course *real*, at least in my experience, greatly enhances the learning process because it is interesting to learn and fun to teach. Students have responded with positive comments and excellent course evaluations. Students have returned from internships at major airlines relating they received the best grade in their class in aircraft systems and international navigation courses. They attended these classes with professional pilots. They attribute their success directly to my courses where tying real world experiences to academic concepts greatly enhanced the learning experience. □

Donald E. Smith holds a Master's in Aeronautical Engineering from the U. S. Naval Postgraduate School and a B.S. in Naval Engineering from the U. S. Naval Academy. He is a graduate of the National War College, the Navy's "Top Gun" Fighter Weapons School, the Naval Aviation Safety Officer School and the Naval Aviation Maintenance Officer School. His flight experience ranges from carrier based fighters to "bush" piloting in West Africa to Boeing 727 first officer with a major airline. He is an Associate Professor of Aeronautical Science at Embry-Riddle Aeronautical University, Daytona Beach, Florida.