

Fundamentals of Instruction

Teaching Practical Risk Management

Objective

Understand the responsibility of the instructor to mitigate risks associated with teaching, and teach students to evaluate risk systematically.

Motivation

Effective risk management is one of the most important skills a pilot needs to learn, understand, and practice as a habit.

Overview

- Teaching risk identification, assessment, and mitigation
- Risk management tools (PAVE, FRAT)
- When and how to introduce risk management
- Risk management by phase of instruction
- Managing risk during flight instruction
- Aeronautical Decision-Making (ADM) & CRM/SRM
- Hazards and obstacles in flight instruction
- Human factors and hazardous attitudes
- Scenario-Based Training (SBT) for risk management
- Maintaining awareness and oversight
- Modeling and teaching safety practices

Teaching Risk Identification, Assessment, and Mitigation

- Teach students to systematically identify, assess, and mitigate risks
- Use structured tools and checklists to guide the process
- Emphasize evaluating both severity (impact) and likelihood (probability) of risks

Risk Management Tools - PAVE Checklist



Emphasize use of the PAVE checklist on every flight.

What are the challenges for operating this flight safely?

- **Pilot:** Experience, health, currency (use IMSAFE)
- **Aircraft:** Airworthiness, equipment, limitations
- **EnVironment:** Weather, terrain, airspace, airports
- **External Pressures:** Schedules, expectations, distractions

Flight Risk Assessment Tools (FRATs)

Risk Assessment Matrix				
Likelihood	Severity			
	Catastrophic	Critical	Marginal	Negligible
Probable	High	High	Serious	
Occasional	High	Serious		
Remote	Serious	Medium		Low
Improbable				

- Structured forms or digital tools to quantify risk before a flight
- Assigns scores to various risk factors (pilot, aircraft, environment, external pressures)
- Helps decide if risk is acceptable, needs mitigation, or flight should be cancelled
- Most basic form is the table
- More advanced computer-based versions use numerical scoring system

Risk Matrix - Examples

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Occasional	High	Serious		
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Improbable				

- Landing light failure on a night flight.
- Engine failure over an extended over-water flight.
- A VFR-only pilot attempts to make a 180nm cross-country trip in MVFR conditions.

When and How to Introduce Risk Management

- Begin risk management instruction at the start of training, including ground lessons
- Reinforce during preflight planning and post-flight debriefs
- Integrate risk management into every lesson, not just as a one-time topic
 - The ACS structure emphasize risk management in every operation
- Emphasize during flight review and recurrent checks as well

Risk Management by Phase of Instruction

- **Pre-solo:** Instructor leads risk analysis, discusses before/after each flight, use of FRAT
- **Pre-solo cross-country:** Learner performs risk analysis with coaching
- **Cross-country training:** Focus on complex, real-world risk scenarios
 - Night flight
 - Unfamiliar airports
 - Complex airspace
- **Instrument/transition/recurrent:** Address unique risks
 - Flight in IMC, weather conditions, icing
 - Transition training to high-performance or complex aircraft

Common Risks During Flight Instruction

- **Pilot risks:**
 - Expect learner mistakes
 - Maintain margin for error
 - Instructor must be current and proficient
- **Aircraft risks:**
 - Ensure airworthiness, be aware of maintenance limitations
- **Environment risks:**
 - Crowded airspace, weather, terrain, night operations
- **External pressures:**
 - Distractions, pressure to complete training, scheduling

IMSAFE Checklist - Student and Instructor

Regularly use the IMSAFE checklist to evaluate your own readiness, but also your students:

1. Illness
2. Medication
3. Stress
4. Alcohol
5. Fatigue
6. Emotions



Special Considerations: Takeoffs & Landings

Takeoffs

- Limited time for instruction
- Brief thoroughly before turning onto runway
- Maintain a sterile cockpit
- Create realistic but safe scenarios for obstacles
- Follow-along on controls





Landings

- Avoid teaching landings mechanically
 - Explain power, stability, airspeed control
 - Build fundamentals first, then apply them to landing
- Keep collision avoidance as a priority
- Use concise prompts during landing
- Follow-along on controls

Aeronautical Decision-Making (ADM), CRM, SRM

- Teach ADM models for systematic decision-making
- Use Crew Resource Management (CRM)
 - Clearly define tasks and roles of each crew member
 - Split and delegate tasks to other crew members as appropriate
- Single-Pilot Resource Management (SRM)
 - Managing all resources available to a single-pilot
- Emphasize communication, workload management, and resource use
 - Task prioritization
 - Checklist usage
 - Autopilot usage

ADM: 5-P Checklist

Review the 5P components at preflight, pre-takeoff, hourly or at the midpoint of the flight, pre-descent, and just prior to entering the traffic pattern.

1. Plan
2. Plane
3. Pilot
4. Passengers
5. Programming

Hazards in Flight Instruction

- Inexperienced students with variety of skills and experiences
- Variety of student emotional reactions
- Instructor's willingness to intervene

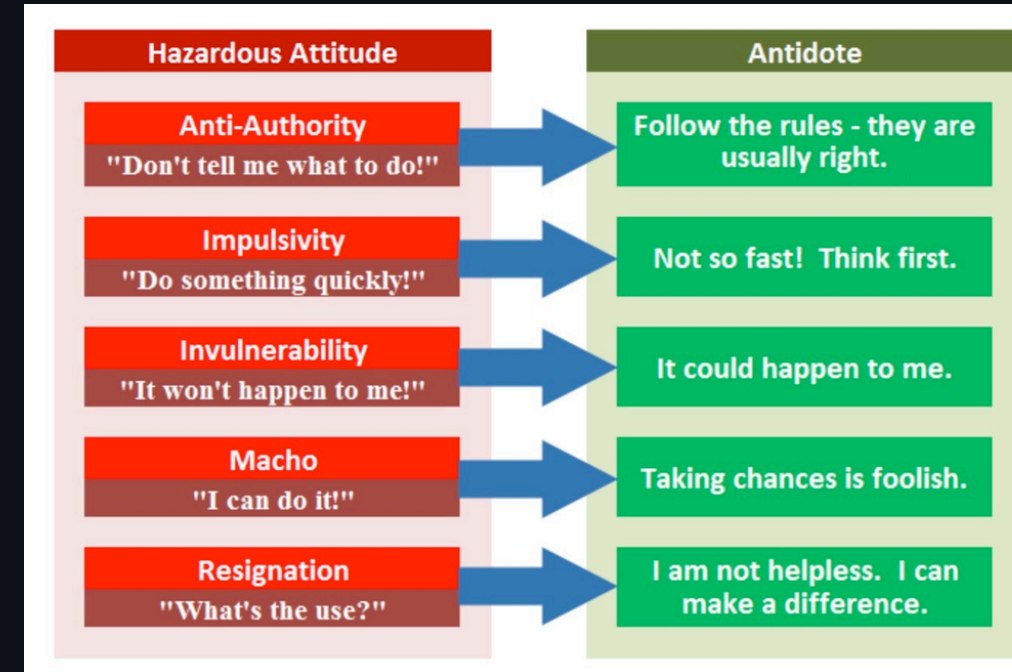


Obstacles to Situational Awareness

- Distractions from instruction tasks
- Fatigue, stress, or complacency
- Expectation bias

Human Factors & Hazardous Attitudes

- Recognize hazardous attitudes (anti-authority, impulsivity, invulnerability, macho, resignation)
- Teach strategies to counteract these attitudes early in a student training
- Monitor both instructor and learner for signs of hazardous thinking





Scenario-Based Training (SBT)

- Use realistic scenarios to teach and assess risk management and ADM
- Scenarios should be relevant to the learner's experience and training phase
- Debrief scenarios to reinforce lessons learned

Maintaining Awareness and Oversight

- Continuous supervision of learner's actions
- Monitor learner's cognitive and physiological state (anxiety, stress, fatigue)
- Maintain overall situational awareness of aircraft and environment



Modeling and Teaching Safety Practices



- Collision avoidance while instructing
 - Demonstrate effective scanning
 - Collision-avoidance prioritization
- Avoid unnecessary distractions
- Maintain coordinated flight
- Use positive exchange of flight controls consistently
- Continuous awareness of aircraft's state and position in the NAS
 - Using all tools available

Summary

- Risk management is a core instructional responsibility.
- Use structured tools (PAVE, FRAT, IMSAFE) and techniques.
- Integrate risk management into all phases of training.
- Model and reinforce safe practices at all times.
- Use scenario-based training to develop real-world risk management skills.