SLIDE: Training & Selection Issues

[344] USING SELF-CRITIQUE TO IMPROVE GENERAL AVIATION PILOTING SKILLS: AN EMPIRICAL INVESTIGATION

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Background: After each practice/training flight during general aviation (GA) pilot training, the instructor debriefs the pilot-in-training. Frequently, however, these debriefs tend to be “one-way”: the instructor talks and the pilot-in-training listens. Recently, research has examined a debriefing strategy which includes learner self-critique (Prince, Salas, Brannick, & Orasanu, 2005). In general aviation, this style of debrief is referred to as “Learner Centered Grading” (LCG) (French, Blickensderfer, Summers, Ayers, & Connolly, 2005). LCG includes two parts. First, the learner completes a self-assessment checklist. Next, the learner discusses this self-assessment in a detailed debrief with his/her instructor. The purpose of the LCG process is to stimulate growth in the learner’s thought processes and, in turn, behaviors. The current study examined the efficacy of the LCG debrief in task management and single pilot resource management skills in GA pilots-in-training. Method: 31 participants (pilots-in-training) performed a 50-minute simulated flight scenario during which a variety of challenging events occurred (e.g., Landing gear failure, Pitot tube freeze-up). Next, each participant was debriefed by a certified flight instructor. Participants in the control group received a traditional style debrief, and participants in the experimental group, received an LCG debrief. The participants then flew another 50-minute flight scenario.

Results: Pilots-in-training in the experimental group demonstrated significantly better performance on behaviors relating to communicating with the passenger, using the checklists, and overall performance than did the pilots-in-training in the control group. Conclusions: Changing the post-exercise debrief to the LCG style improved pilot-in-training performance on task management related skills. Most likely, these results will generalize to other skills. This research demonstrates the LCG style debrief’s effectiveness and also underscores the importance of feedback, in general, to simulation based training.

Learning Objectives: 1. Describe the “Learner Centered Grading” debriefing style. 2. Explain the difference between the “Learner Centered Grading” flight debrief and the traditional style of debrief. 3. Describe the research methods used in this study.

[345] THE ATTITUDES OF U.S. NAVY DIVERS TOWARDS THE NONTECHNICAL SKILLS REQUIRED FOR SAFE AND PRODUCTIVE DIVING OPERATIONS

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Introduction: Although U.S. Navy diving is remarkably safe, when accidents do occur, the majority are caused by nontechnical or human factors errors. An attitude questionnaire based upon the Flight Management Assessment Questionnaire (FMAQ) was used to assess diving attitudes. Results: The confirmatory factor analysis (CFA) process resulted in a stable factor structure, with an acceptable level of reliability for the three subscales of the attitude questionnaire. From the 272 responses obtained, junior divers are found to want to ask questions, but seniors do not desire to be questioned. Furthermore, Navy officers and inexperienced divers are more sensitive to the effects of fatigue and stress on performance than senior divers. Discussion: Crew Resource Management (CRM) training may provide a palatable method for changing the attitudes of U.S. Navy divers to the nontechnical skills required for safe and productive diving operations.

Learning Objectives: 1. The attitudes of U.S. Navy divers towards the nontechnical skills required for safe and productive diving operations will be discussed.

[346] SPATIAL ABILITY AS A PREDICTOR OF SPACE ROBOTICS TRAINING PERFORMANCE

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Introduction: Current astronaut robotics training procedures are both long and intensive. Trainees vary significantly in their initial performance, natural ability, rate of learning, and level of mastery. Initial performance is not a reliable predictor of final level of mastery and, in a few cases a protracted training period is needed to achieve mastery. We hypothesize that metrics of human spatial ability can predict performance on certain tasks, such as maintaining spatial situation awareness and arm clearance, that are learned and practiced during robotics system training. Method: We tested the spatial ability of 40 current astronauts with robotics training experience against four tests: 2D Card Rotation (Card), Vandenberg Mental Rotation (MRT), the Purdue Spatial Visualization – Views (PSVT) and Perspective Taking Ability (PTA). These were correlated with scores on the NASA Aptitude for Robotics Test (ART) “Gate” task, a measure of initial robotics performance, and the General Spatial Awareness (SA) score of the astronauts’ final evaluation test of their first robotics training course. Results: Card, MRT, and PSVT scores and the General SA score for ART, as well as among MRT, PSVT, and PTA and the logstandardized “Gate” score. As expected, significant correlation was found between the initial ability and final level of mastery. No significant effect of gender was found. Discussion: The Card Rotation, Mental Rotation, and Purdue Spatial Tests are potential predictors of General Situation Awareness performance during robotics training. Further analysis of performance in individual lessons of a training course will determine if learning rates can also be predicted. Supported by NASA Cooperative Agreement NCC9-1 with NSBRI.