Transfer of training from simulator to aircraft – the usefulness of embedded training tools

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Successful transfer of training from the simulator to operative performance is an important issue for effective training procedures. A study was performed with ACES, a virtual reality- based flight simulator with an extensive set of embedded training tools. Pilot students from the Swedish Air Combat Training School's basic flight training program participated. The study had a mixed design with two independent groups and five repeated measures. Before training of five specific manoeuvres in the real aircraft, half of the participants received instructor-based simulator training (in ACES) of each specific manoeuvre, including after action review with the training tools. After performing each manoeuvre in the real aircraft, all pilot students answered a questionnaire concerning their experiences of the performed training session. The questionnaire contained both rating scales and open questions. The results indicate that the simulator training in ACES leads to higher situation awareness and enhanced understanding of manoeuvring. This was most evident for the first manoeuvres, thus indicating highest training effects of the simulator in initial training phases. The pilot students found the training tools to be very useful. The training tool that shows the flight paths was especially important for enhanced understanding.

Background

Apart from the desire to avoid unnecessary risks on human life, simulator training can reduce costs. Furthermore, simulators can provide efficient training, since focus can be placed directly on the training task. Conversely, flying a real aircraft may require coordination with numerous other services (e.g. air traffic control and maintenance), and need appropriate weather and visibility conditions (Lee, 2005).

Simulator training also increases the possibilities to hold extraneous variables constant, which may enhance the instructor's capacity to getting an adequate picture of the trainees' skills, or learning curves, on different procedures or manoeuvres.

Two concepts strongly associated with simulator training are *transfer of training* and *fidelity*. Transfer of training refers to how previous learning influences behaviour in a later situation. In this context, how simulator training influences future skill acquisition in the real aircraft. Transfer of training can be positive, nil, or negative

In D. de Waard, A. Axelsson, M. Berglund, B. Peters, and C. Weikert (Eds.) (2010). *Human Factors: A system view of human, technology and organisation* (pp. 327 - 335). Maastricht, the Netherlands: Shaker Publishing.